



Santa Barbara County
Air Pollution Control District

MAR 31 2000

Via Certified Mail 1276 8948
Return Receipt Requested

Ben Heuser
Manager, Engineering Services
MM Tajiguas Energy LLC
1221 Nicolle Mall, Suite 700
Minneapolis, MN 55403-2445

Phil Demery, Director
Santa Barbara County Public Works Department
123 East Anapamu Street
Santa Barbara, CA 93101

FID: 08676
Permit: A/P9788
SSID: 03707

Re: *Final Combined ATC/PTO 9788 – Tajiguas Landfill Gas to Energy Project:*
Gas Collection and Standby Enclosed Ground Flare System

Gentlemen:

Please find enclosed the *final* permit for operations of the existing gas collection and enclosed ground flare system at the Santa Barbara County Tajiguas Solid Waste Landfill. This system was installed as authorized under Authority to Construct No. 9788, and is now operating to comply with federal New Source Performance Standard, 40 CFR, Subpart WWW that applies to the Tajiguas Landfill. Please note that this permit does not fulfill the requirements of a federal Part 70 permit for these operations; it only fulfills the permitting requirements specific to APCD rules and regulations. This final permit reflects and incorporates the March 27, 2000 comments received from MM Tajiguas Energy LLC on behalf of the project.

Please carefully review the enclosed documents to ensure that they accurately describe your facility and that the conditions are acceptable to you. Note that your permitted emission limits may, in the future, be used to determine emission fees.

You should become familiar with all APCD rules pertaining to your facility. This permit does not relieve you of any requirements to obtain authority or permits from other governmental agencies.

Unless otherwise specified, this permit supersedes all previously-issued air quality permits for the equipment described.

Please be aware that this permit requires you to do the following:

- Ensure that all specified conditions are met.
- Ensure that a copy of the enclosed permit is posted or kept readily available near the permitted equipment.
- Promptly report changes in ownership, operator, or your mailing address to the APCD.

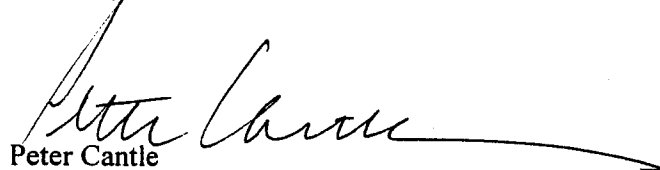
Douglas W. Allard
26 Castilian Drive B-23, Goleta, CA 93117 Fax: 805-961-8801 Phone: 805-961-8800

Air Pollution Control Officer

If you are not satisfied with the conditions of this permit, you have **10 days after receipt of this notice to appeal this permit to the Air Pollution Control District Hearing Board** (APCD Rule 209 and California Health and Safety Code Section 42302.1). Any contact with APCD staff to discuss the terms of this permit will not stop or alter the 10 day appeal period. According to District Rule 210.IV.B, your appeal will not be heard unless all fees are paid.

Please include the FID and Permit numbers as shown on page one of this letter on all correspondence regarding this permit. If you have any questions, please contact Steve Sterner of my staff at 805/961-8886.

Sincerely,



Peter Cantle
Manager, General Source Division

enc: Final Combined ATC/PTO 9788
Air Toxics "Hot Spots" Fact Sheet

cc: Inspector Supervisor (cover letter only)
Project File (SC)
GSD/MSD Chron File
Permit Engineer (cover letter and 2 sided copy of permit)
Amie Fredrick, Labno Environmental (Cover letter and permit via e-mail only)
Jim Ryerson, RM&A ((Cover letter and permit via e-mail only)
Chris Wilson, SBCPW – Solid Waste Division (cover letter and 2 sided copy of permit)



**Santa Barbara County
Air Pollution Control District**
Our Vision: Clean Air

-- Decision to Issue --

**FINAL COMBINED
MODIFIED AUTHORITY TO CONSTRUCT
&
PERMIT TO OPERATE 9788**

for the

**TAJIGUAS LANDFILL GAS TO ENERGY PROJECT
(Gas Collection and Standby Enclosed Ground Flare Systems)**

EQUIPMENT OWNERS & OPERATORS

**NEO TAJIGUAS LLC - Landfill Gas Collection & Conditioning System
MM TAJIGUAS ENERGY LLC - Standby Enclosed Ground Flare System
SANTA BARBARA COUNTY DEPARTMENT OF PUBLIC WORKS ("SBCPW")**

LOCATION

**Santa Barbara County Tajiguas Landfill
14470 Calle Real**

**Santa Barbara County
Air Pollution Control District**

March 31, 2000

Table of Contents

1. PROJECT DESCRIPTION	1
1.1 PURPOSE.....	1
1.2 FACILITY OVERVIEW	2
1.3 PRIMARY EMISSION SOURCES	4
1.4 CONTROL TECHNOLOGY OVERVIEW	4
1.5 REGULATORY OVERVIEW.....	4
1.6 PRIOR AIR QUALITY PERMITTING HISTORY	5
2. PROCESS DESCRIPTION.....	6
2.1 LANDFILL GAS COLLECTION AND CONDITIONING SYSTEM.....	6
2.2 LANDFILL GAS COMBUSTION.....	6
3. REGULATORY REVIEW	7
3.1 RULE EXEMPTIONS CLAIMED.....	7
3.2 COMPLIANCE WITH APPLICABLE FEDERAL RULES	7
3.2.1 40 CFR Parts 51/52 {New Source Review (Nonattainment Area Review and Prevention of Significant Deterioration)}.....	7
3.2.2 40 CFR Part 60 {New Source Performance Standards}.....	7
3.3 COMPLIANCE WITH APPLICABLE STATE RULES AND REGULATIONS	13
3.4 COMPLIANCE WITH APPLICABLE LOCAL RULES AND REGULATIONS	13
3.4.1 Regulation II {Permits} and Regulation VIII {New Source Review}	13
3.4.2 Regulation III {Prohibitions}.....	16
3.4.3 Regulation V {Hearing Board}.....	18
3.4.4 Regulation VI {Emergencies}	19
3.4.5 Regulation IX {New Source Performance Standards}	19
3.4.6 Regulation X {NESHAP}	19
3.4.7 Regulation XIII {Part 70 Operating Permits}.....	19
3.5 PERMIT COMPLIANCE REVIEW	19
4. ENGINEERING EVALUATION	19
4.1 GENERAL.....	19
4.2 EQUIPMENT SPECIFIC REVIEW.....	20
4.2.1 Landfill Gas Collection and Conditioning.....	20
4.2.2 The "Standby" Enclosed Ground Flare	21
4.3 OTHER EMISSION SOURCES	21
4.3.1 Landfill Operations - Fugitive Organic Gas Emissions.....	21
4.3.2 Landfill Operations - Fugitive Dust Emissions.....	22
4.3.3 Landfill Operations - Mobile Source Emissions	22
4.4 BEST AVAILABLE CONTROL TECHNOLOGY (BACT).....	22
4.4.1 Standby Enclosed Ground Flare.....	23
4.5 EMISSIONS MONITORING.....	26
4.6 SOURCE TESTING, SAMPLING, MONITORING AND METER CALIBRATION.....	27
4.6.1 Source Testing.....	27
4.6.2 Sampling	28
4.6.3 Monitoring.....	30
4.6.4 Meter Calibration	30
5. PROJECT EMISSIONS.....	31
5.1 GENERAL.....	31

5.2	LANDFILL GAS EMISSION FACTORS.....	31
5.3	PERMITTED EMISSION LIMITS - EMISSION UNITS	32
5.4	PERMITTED EMISSION LIMITS - FACILITY TOTALS	32
5.5	EXEMPT EMISSION SOURCES	33
6.	AIR QUALITY IMPACT ANALYSIS.....	38
6.1	SCOPE OF REVIEW	38
6.2	LANDFILL AND ENERGY PROJECT HEALTH RISK ASSESSMENT ("HRA")	38
6.3	VEGETATION AND SOILS ANALYSIS	40
6.4	POTENTIAL TO IMPACT VISIBILITY AND OPACITY	40
6.5	PUBLIC NUISANCE	40
6.6	AMBIENT AIR QUALITY MONITORING.....	40
7.	OFFSETS AND CLEAN AIR PLAN CONSISTENCY	40
7.1	OFFSETS	40
7.2	CLEAN AIR PLAN CONSISTENCY	41
8.	CEQA/LEAD AGENCY PERMIT	41
8.1	CEQA REQUIREMENTS	41
8.2	CEQA FINDINGS	43
8.3	LEAD AGENCY PERMIT REQUIREMENTS.....	43
9.	PERMIT CONDITIONS	44
10.	ATTACHMENTS	56

List of Figures and Tables

FIGURE 1.1 - TAJIGUAS LANDFILL GAS TO ENERGY PROJECT	3
TABLE 4.1 - BACT SUMMARY:	
STANDBY LANDFILL GAS ENCLOSED FLARE,	
(>24 MMBTU/HR HIGH HEATING VALUE INPUT)	25
TABLE 4.2 - EMISSIONS MONITORING PROGRAM	26
TABLE 4.3 - SOURCE TEST PARAMETERS	29
TABLE 5.1- PROJECT EMISSIONS UNIT EQUIPMENT SPECIFICATIONS	34
TABLE 5.2 - PROJECT HOURLY AND DAILY EMISSIONS	35
TABLE 5.3 - PROJECT QUARTERLY AND ANNUAL EMISSIONS	35
TABLE 5.4 - PROJECT EMISSION FACTORS	36
TABLE 5.5 - EXEMPT EMISSION SOURCES	37
TABLE 6.1 - LANDFILL AND ENERGY PROJECT HEALTH RISK ASSESSMENT RESULTS	39
TABLE 9.1 - PERMIT CONDITIONS	44
TABLE 9.2 - CONDITION APPLICABILITY	46
TABLE 9.3 - OPERATIONAL INCREMENT FEES	55

List of Acronyms and Abbreviations

APCD	Air Pollution Control District (Santa Barbara County) or District
APCO	Air Pollution Control Officer
AQIA	Air Quality Impact Analyses
ASTM	American Society for Testing and Materials
ATC	Authority to Construct permit
BACT	Best Available Control Technology
BAAQMD	Bay Area Air Quality Management District
Btu	British thermal unit
CAP	Clean Air Plan
CARB	California Air Resources Board
CEMS	continuous emissions monitoring system
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
County	Santa Barbara County
DAS	APCD Data Acquisition System
District Santa Barbara County Air Pollution Control District or District	
EIR	Environmental Impact Report
FR	Federal Register
g	gram
gr	grain
HHV	higher heating value
H ₂ S	hydrogen sulfide
H&SC	California Health and Safety Code
IC	internal combustion
I&M	inspection and maintenance
ISC	industrial source complex (an air quality model)
k	thousand
lb	pound
MM, mm	million
MMTE	MM Tajiguas Energy LLC (permittee for Energy Production System)
MW	molecular weight or Mega-Watt
MSW	Municipal Solid Waste
NEI	net emissions increase
NEOT	NEO Tajiguas LLC (permittee for the Landfill Gas Collection and Conditioning System)
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NMOC	non-methane organic compounds
NO _x	oxides of nitrogen (calculated as NO ₂)
NO ₂	nitrogen dioxide
NSPS	New Source Performance Standards
NSR	New Source Review
PFD	process flow diagram
P&ID	piping and instrumentation diagram
ppmvd	parts per million volume dry (concentration)

psia	pounds per square inch absolute
psig	pounds per square inch gauge
PM	particulate matter
PM ₁₀	particulate matter less than 10 microns in size
PTE	Permitted Potential to Emit
PTO	Permit to Operate
PUC	Public Utilities Commission
Project	The combined SBCPW, NEO Tajiguas LLC and MM Tajiguas Energy LLC, Landfill Gas to Energy Project authorized under this permit.
ROC	reactive organic compounds
SBCAPCD	Santa Barbara County Air Pollution Control District or District, or APCD
SCDP	Source Compliance Demonstration Period
SBCPW	Santa Barbara County Department of Public Works
scf, SCF	standard cubic feet
SCFD	standard cubic feet per day
SCFM	standard cubic feet per minute
SCAQMD	South Coast Air Quality Management District
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SO _x	sulfur oxides (calculated as SO ₂)
SO ₂	sulfur dioxide
THC	total hydrocarbons
TRS	total reduced sulfur (all gaseous phase molecular species which contain sulfur)
tpy	tons per year
USEPA	United States Environmental Protection Agency or EPA
vol %	volume percent or volume fraction
wt %	weight percent or weight fraction

This page deliberately left blank.

1. PROJECT DESCRIPTION

1.1 Purpose

Consistent with APCD Regulations II, III and VIII the APCD has decided to issue to NEO Tajiguas LLC, Minnesota Methane Tajiguas LLC, and the Santa Barbara County Public Works Department (hereafter referred to as "the permittees") a combined modified Authority to Construct ("ATC") / Permit to Operate ("PTO") number 9788. A combined ATC/PTO is required because increases in the amounts of landfill gas flows and the gases total sulfur contents were required versus those that were specified under the original ATC 9788. These changes were discovered during the Source Compliance Demonstration Period ("SCDP") for ATC 9788 that started in November 1998. This permit authorizes permanent operations of the installed components of a landfill gas to energy project permitted under ATC 9788 that was issued in February 1998. To date, the following components of the landfill gas to energy project have been installed and tested:

- A system to collect landfill gas generated by the Tajiguas Landfill. This system is comprised of collection wells, a piping system, a gas collection blower, and gas conditioning equipment to remove particulate and liquids from the collected landfill gas before combustion. This system is owned and operated by NEO Tajiguas LLC (hereafter referred to as "NEOT"). During the SCDP, it was discovered that the total sulfur content of the landfill gas could exceed the 22 ppmv limit specified in ATC 9788. This permit authorizes the total sulfur content to increase up to 50 ppmv, as H₂S equivalents. In addition, the landfill gas production rate was found to be in excess of that allowed under ATC 9788. This permit authorizes the gas collection and combustion rate increase from 1600 SCFM to 2000 SCFM.
- An enclosed ground flare that combusts all the landfill gas production collected by the system described above. This flare system is owned and operated by MM Tajiguas Energy LLC (hereafter referred to as "MMTE").

The internal combustion engine driven electrical generator system permitted under ATC 9788 has not yet been installed. Its operations are not permitted under this permit. However, ATC 9788 is still in force to authorize installation and limited operations of the engine during a SCDP. The engine is expected to become operational sometime during the summer of 2000.

Pursuant to the permittees' combined modified ATC/PTO 9788, the APCD has determined that the project:

- Should operate without emitting air pollutants in violation of any applicable Federal, State or Local emission limitation or standard;
- Is reducing the Tajiguas Landfill's landfill gas fugitive emission rate emanating from and around the landfill's soil cover. During operations in 1999, the project has reduced the landfill's uncontrolled emissions of methane (a greenhouse gas), and ROC emissions by approximately 7655 and 30 tons per year, respectively. Concurrent reductions in "health risk" associated with reduction in toxic

emissions have also occurred; and

- Is utilizing Best Available Control Technology ("BACT") for the control of landfill gas combustion generated NO_x and ROC emissions from the enclosed ground flare system. Use of BACT minimizes this project's generation of secondary pollutants created from the combustion of the captured landfill gas and which are considered ozone precursors.

1.2 Facility Overview

The project's facility will reside entirely within the existing Tajiguas Landfill property on Parcels #81-150-019, #81-150-26 and #81-150-21, which are located at 14470 Calle Real near the Gaviota area of south Santa Barbara County. The Tajiguas Landfill is owned by Santa Barbara County, and is operated by the Santa Barbara County Public Works Department, Solid Waste and Utilities Division. This landfill has been in operations since 1967. The facility equipment is located immediately south of the Tajiguas Landfill parcel. A detailed map of the project site and approximate location of the landfill gas collection wells within the landfill property are shown in Figure 1.1.

Figure 1.1 - Tajiguas Landfill Gas to Energy Project



1.3 Primary Emission Sources

This permit authorizes the operations of a landfill gas collection system and an enclosed ground flare to combust the collected landfill gas. Collected landfill gas condensate is also disposed of by injecting it, in a controlled manner, into the flares flame zone. This process vaporizes the condensate and also combusts any dissolved organic materials. The net result of this process is reduced fugitive organic gas emissions from the Tajiguas Landfill. Fugitive organic gas emissions, which include methane, ethane, reactive organic compounds ("ROCs") and certain toxic organic species, are significantly reduced (but not eliminated) by this project. Basically, that which is collected and combusted by this project is not emitted directly to the atmosphere as a fugitive emission from the landfill.

Other emissions associated with the existing Tajiguas Landfill, such as particulate emissions from the movement of traffic within the landfill, earthmoving equipment operations, and disturbed ground areas of the landfill, in addition to vehicle-generated fuel combustion emissions are not regulated by this permit. The existing landfill's operational particulate emissions are comprised of total suspended particulate, and particulate matter less than 10 microns in aerodynamic diameter (PM_{10}). The new equipment authorized under this permit could generate an additional 14 tons per year of PM_{10} particulate emissions, produced as a byproduct of combusting the landfill gas.

1.4 Control Technology Overview

This permit does not require any controls for the particulate emissions generated by the existing landfill operations. The existing landfill operational emissions and fugitive dust emissions control/mitigation are the responsibility of the Santa Barbara County Public Works Department, Solid Waste and Utilities Division. This permit and its requirements are limited to the NEOT and MMTE project to capture landfill gas and flare (or burn) it.

The flare meets established BACT standards for NO_x and ROC for this class of device: a landfill gas-fired enclosed flare rated at and above 24 MMBtu/hr. These standards are met in this equipment through burner design, adequate combustion zone residence time (i.e., >0.6 seconds), and fuel-to-air ratio control, using a combustion zone temperature control system (to 1600 °F).

1.5 Regulatory Overview

The project described in this permit is consistent with the discretionary land-use Conditional Use Permit #95-CP-046(ZA), approved by the Santa Barbara Zoning Administrator (with the Planning and Development Division acting as "lead agency") on November 21, 1995. On December 22, 1997 the County Zoning Administrator extended this Conditional Use Permit ("CUP") for two additional years. This permit and its conditions (see Section 9) are consistent with and satisfy all relevant air quality issues within the CUP and the California Environmental Quality Act ("CEQA") Notice of Exemption ("NOE") prepared for this project. Pursuant to section 21151.1(d)(2) of the California Public Resources Code, this project qualified for an exemption from CEQA because the project exclusively burns gas (i.e., methane) produced from a solid waste disposal site.

1.6 Prior Air Quality Permitting History

NEOT and MMTE were issued modified ATCs 9788-01 and 9788-02 in June and September 1998. Those permits authorized the operations of a temporary ground flare installation to handle gas collected from the landfill gas collection system installed during the spring of 1998. This temporary ground flare system was shut down and replaced with the permanent flare system described under this ATC/PTO 9788 during November 1998.

There is only one other recorded air quality permit for operations at the Tajiguas Landfill. This permit was issued to the Solid Waste and Utilities Division at the Tajiguas landfill for a 12,000 gallon above-ground diesel fuel storage tank and associated fuel dispensing cabinet to service the mobile equipment operations in the landfill (PTO #8965). This permit was canceled on November 13, 1997 subsequent to a change in the APCD's Rule 202 - Exemptions from Permit, which no longer required a permit for such equipment. Lastly, the APCD does not require permits for the solid-waste landfill operations at Tajiguas or elsewhere in Santa Barbara County.

2. PROCESS DESCRIPTION

There are two basic processes authorized for operations under this permit. One process is the landfill gas collection and conditioning system. The other process is combusting the landfill gas in an enclosed ground flare. The two processes are more fully described in detail below.

2.1 Landfill Gas Collection and Conditioning System

This system is comprised of a sufficient number of vertical wells drilled through the landfill's surface cover into existing refuse deposition zones. Some of the vertical wells may be as deep as 100 feet below the surface. In areas where new refuse will be deposited, horizontal wells will be installed. After sufficient refuse and top soil covers the horizontal wells, these wells are then connected to the collection system. All landfill gas collection wells deliver gas to a central collection point through a series of collection pipes and headers. Landfill gas is drawn to this centralized point by use of electric motor driven gas blower rated to 2000 SCFM that draws a vacuum on the collection system piping and wells.

Once the landfill gas is collected, it is first scrubbed of particulate and moisture in a knock-out drum. The moisture, called landfill gas condensate, is disposed of primarily by injection into the flame zone of the flare, and secondarily by offsite disposal to an authorized handler of such waste (typically a water treatment facility). MMTE operates and manages this system consistent with an APCD-approved condensate Disposition ("CD") Plan.

The initially scrubbed landfill gas then goes through the collection blower and another scrubber where additional condensate is knocked-out of the landfill gas. The condensate is routed to an onsite storage tank where it is reinjected with a pump into the flare flame zone. The scrubbed landfill gas is fed to the flare.

2.2 Landfill Gas Combustion

The project uses an 8 foot diameter, 40 foot tall enclosed ground flare to burn up to 2000 SCFM of collected and scrubbed landfill gas. In the flare the flame zone temperature is maintained at 1600 °F by controlling the amount of excess air fed to the flame zone. The flare meets applicable BACT performance standards for the control of NO_x and ROC emissions. Source testing during 1999, also confirmed that the applicable NMOC destruction efficiencies of NSPS, Subpart WWW were complied with.

3. REGULATORY REVIEW

3.1 Rule Exemptions Claimed

APCD Rule 202 (Exemptions to Rule 201 - Permits): The permittees have not claimed any permit exemptions pursuant to any specified Rule 202 exemption.

3.2 Compliance With Applicable Federal Rules

3.2.1 40 CFR Parts 51/52 {New Source Review (Nonattainment Area Review and Prevention of Significant Deterioration)}

This project is subject to Santa Barbara County APCD Regulation VIII that addresses New Source Review requirements. The USEPA has delegated the APCD authority to implement the Nonattainment area review and PSD requirements through the use of Regulation VIII. Regulation VIII addresses all pertinent NSR requirements such as BACT, AQIA, offsets and public noticing. As such, compliance with APCD Regulation VIII assures compliance with 40 CFR Parts 51/52. See section 3.4.1 below for a discussion on Regulation VIII rule requirements and compliance.

3.2.2 40 CFR Part 60 {New Source Performance Standards}

This project is required to comply with applicable federal New Source Performance Standards and the provisions of Part 60, Chapter 1, Title 40 of the Code of Federal Regulations. Specific compliance items are discussed below in section 3.2.2.3.

3.2.2.1 Subpart A. (Section 60.7) - General Conditions:

This section specifies general requirements applicable to a source affected by New Source Performance Standards, including specifications pertaining to notifications, recordkeeping, performance testing, compliance with standards, maintenance, monitoring, and general control device requirements. The permittees are complying with the provisions of this subpart through this permit.

3.2.2.2 Subpart A. (Section 60.7) - General Control Device Requirements:

This section lists requirements for control devices subject to Parts 60 and 61. Specifically, flares operating in certain types of affected facilities are subject to the requirements of this section. However, this project is not proposing to operate a "flare" (i.e., an open-pipe-type flare) as defined in Subpart WWW, therefore, the provisions of this subpart are not triggered.

3.2.2.3 Subpart WWW. (Section 60.750 through 60.759) - Standards of Performance for Municipal Solid Waste Landfills

The Tajiguas Landfill was issued a permit by Santa Barbara County Environmental Health Services (with the concurrence of the California Integrated Waste Management Board) for operations on February 22, 1995. Based on this fact, in accordance with Subpart WWW, §60.750, this landfill is considered to have accepted waste on or after May 30, 1991 and therefore is subject to the Subpart WWW requirements. Because it has a design capacity in excess of 2.5 million megagrams of refuse, and also has a calculated uncontrolled NMOC emission rate in excess of 50 megagrams, Section 60.750 through 60.759 apply to the Tajiguas Landfill and this Landfill Gas to Energy Project. Some significant requirements, and project compliance status with this Subpart WWW are summarized below:

§ 60.752 - Standards for Air Emissions from MSW Landfills:

1. Shall install a collection and control system by December 1998.

Compliance Status: In compliance, the gas collection equipment began operating in June 1998 and used a temporary ground flare under ATC 9788-01 of smaller capacity than that permitted herein this permit. The enclosed flare permitted herein began operating in November 1998.

2. The project uses an "active" landfill gas collection system. This system must meet the following requirements:
 - Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control;
 - Collect gas from each area, cell, or group of cells in the landfill in which waste has been in place for a period of 5 years or more if the cell is active; or 2 years or more if the area is closed or at final grade;
 - Collect gas at a sufficient extraction rate; and,
 - Minimize off-site migration of subsurface gas.

Compliance Status: According to March 19, 1999 correspondence from the permittee, the installed gas collection system follows the 6/10/97 EMCON "Design Plan," with a couple of exceptions, as follows: Three wells were redrilled, and two additional perimeter migration wells were drilled. All changes are reflected in "as-built" drawings in the possession of SB County Solid Waste & Utilities Division. It appears based on these facts, that the project is in compliance with these requirements.

3. All collected gas must be routed to a control system that meets the following requirements:
 - It must be designed and operated to reduce NMOC by 98 weight percent; or, if an enclosed combustion device is used, it may alternately comply with a NMOC concentration limit of less than 20 ppmvd, as hexane at 3 percent oxygen.

Compliance Status: In compliance. The APCD-witnessed source test on February 25, 1999, showed compliance with the minimum 98% NMOC destruction efficiency for the enclosed flare. Compliance also was demonstrated with the 20 ppmvd NMOC as hexane at 3 percent oxygen limit.

- The control efficiency shall be established during an initial performance test under §60.8 using the test methods of §60.754(d).

Compliance Status: In compliance. NMOC destruction efficiency for the enclosed flare during the February 25, 1999 source test was verified to comply with the alternative exhaust limit of 20 ppmv as hexane, corrected to 3% excess oxygen (actual value was 0.3 ppmv NMOC as hexane, at 3% oxygen).

- The control device shall be operated within the parameter ranges established during the initial or most recent performance test.

Compliance Status: In compliance as demonstrated through quarterly reports and onsite records of flare temperature control system.

- Applicable §60.756 operating parameters must be monitored.

Compliance Status: In compliance. Approved quarterly report format, and Surface Monitoring Maintenance and Recordkeeping (SMMR) Plan specify that all required operating data is gathered, recorded, and reported.

4. The collection and control system must operate in compliance with all applicable provisions of §§60.753, 60.755 and 60.756.

§ 60.753 - Operational Standards for Collection and Control Systems:

1. Operate the collection system with a negative pressure at each wellhead except under certain conditions indicative of a fire, area cover type, or wellhead declining flows.

Compliance Status: Quarterly report received to date show compliance with this specification.

2. Operate each interior wellhead, as follows:

- With a landfill gas temperature less than 55 °C and either a nitrogen or oxygen level less than 20 percent or 5 percent, respectively; or
- With higher operating temperature and nitrogen/oxygen values upon demonstration that fires or the killing of methanogens are not occurring from such different values.

Compliance Status: In compliance. Quarterly reports received to date for the 1st through 3rd quarters of 1999 operations document that certain collection wells were found out of compliance with only the 5 percent oxygen limit specification. Each out-of-specification well was adjusted to a lower flow rate to pull less air (oxygen) into the well draw zone, as a result of the aberrant readings.

3. Operated the collection system so that the methane concentration is less than 500 ppmv above background at the surface of the landfill. This shall be done by:
 - Using a surface testing program around and traversing the landfill at 30 meter intervals; and
 - Developing and following a surface monitoring design plan that includes a topographical map of the landfill and the monitoring route, and any rationale for site-specific deviations from the 30

meter intervals. Areas with steep slopes or other dangerous areas may be excluded from surface testing.

Compliance Status: In compliance pursuant to approved SMMR Plan specified in under permit Condition No. 21.

4. In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour.

Compliance Status: In compliance. The flare (i.e., the landfill gas control system) is equipped with a shutdown interlock system that shuts down the landfill gas collection blower and gas delivery piping when the flare shuts down.

5. The landfill gas control system shall be operated at all times when collected gas is routed to the system.

Compliance Status: In compliance. The flare (i.e., the landfill gas control system) is equipped with a shutdown interlock system that shuts down the landfill gas collection blower and gas delivery piping when the flare shuts down.

§ 60.754 - Test Methods and Procedures

1. After the installation of a collection and control system in compliance with §60.755, the project shall calculate the NMOC emission rate using the equation in §60.754(b) from the landfill for purposes of determining when the system can be removed as provided in §60.752 (b)(2)(v), and the following other requirements:
 - The collected landfill gas, Q_{LFG} , shall be measured using a gas flow measuring device calibrated according to §4 of Method 2E of appendix A of this part;
 - The average NMOC concentration of the collected gas, C_{NMOC} shall be determined from a landfill gas collection sample taken before the gas moving, or condensate collection system. The procedures of Method 25C or Method 18 of appendix A of this part shall be used to analyze the gas sample for NMOC. Specific conditional provisions are specified for Methods 25C and 18; and
 - Other gas flow rate and NMOC measurements may be used if approved by the Administrator (i.e., the EPA).
2. For the NMOC destruction (i.e., control) efficiency performance test of the landfill gas controls system, Method 25 or Method 18 of appendix A data shall be used. NMOC control efficiency shall be calculated as follows:

$$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out}) / (NMOC_{in})$$

where,

$NMOC_{in}$ = mass of NMOC entering control device
 $NMOC_{out}$ = mass on NMOC exiting control device.

Or, in lieu of the above, the source can demonstrate compliance with these requirements if the exhaust from the control does not exceed 20 ppmv NMOC as hexane, corrected to 3% excess oxygen.

Compliance Status: In compliance as demonstrated through the February 25, 1999 source test program of the flares exhaust that showed NMOC to be 0.3 ppmv as hexane, corrected to 3% excess oxygen.

§ 60.755 - Compliance Provisions

1. The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment, or control devices (e.g., the enclosed ground flare).

Compliance Status: Examination of the Quarterly Reports received from the permittees indicates compliance with the five day requirement for collection systems. The ground flare is interlocked with the collection system blower such that one cannot operate without the other operating. This ensures compliance with the 1 hour standard for the control device.

2. The project shall place each well or design component as specified in an approved design plan as provided in §60.752(b)(20(i). Each well shall be installed within 60 days of the date in which the initial solid waste has been in place for a period of:

- ⇒ 5 years or more if the cell area is active; or
- ⇒ 2 years or more if the cell area is closed or at final grade.

Compliance Status: Ongoing compliance will be assessed as the landfill areas reach closure. Indirect compliance can be determined through compliant checks of surface and perimeter monitoring of methane leaking from the landfill. If inadequate collection wells are in place, compliance with the SMMR Plan will also not be obtained.

3. The project shall determine whether the gas collection system is in compliance with §60.752(b)(2)(ii) {as is the case with Tajiguas, when gas collection systems are required because landfill NMOC emissions exceeds 50 megagrams per year}.

Compliance Status: See items 4 through 6 directly below for a discussion of compliance:

4. Shall monitor each collection well monthly for:
 - gauge pressure to determine if collection flow is adequate; and
 - nitrogen and oxygen content to assess if excess air infiltration is occurring.

Compliance Status: In compliance per approved Surface Monitoring, Maintenance and Recordkeeping (SMMR) Plan required under Condition No. 21 of this permit.

5. Shall monitor for landfill surface methane concentrations on a quarterly basis, according to an approved surface testing plan, and use of specified testing and instrumentation requirements.

Compliance Status: In compliance per approved Surface Monitoring, Maintenance and Recordkeeping (SMMR) Plan required under Condition No. 21 of this permit.

6. Shall implement a program to monitor landfill cover integrity and implement cover repairs as necessary on a monthly basis.

Compliance Status: In compliance per approved Surface Monitoring, Maintenance and Recordkeeping (SMMR) Plan required under Condition No. 21 of this permit.

§ 60.756 - Monitoring of Operations

This project uses an active landfill gas collection system, and an enclosed combustion-type control system. As such, the following §60.756 requirements apply to this project:

1. For the active landfill gas collection system:
 - Each wellhead shall have a sampling port and a temperature measuring device.
 - The gauge pressure of the gas collection header shall be read monthly.
 - The wellhead nitrogen or oxygen concentration in the landfill gas shall be monitored on a monthly basis.
 - Each wellhead's temperature shall be monitored on a monthly basis.

Compliance Status: In compliance. The approved quarterly reports indicate that these measurements are obtained and recorded.

2. For the enclosed combustion (i.e., the IC engine, Afterburner, and the Standby Enclosed Ground Flare) control equipment, shall calibrate, maintain, and operate a gas flow rate measuring device that provides a measurement of gas flow to, or bypass of, the control device.

Compliance Status: In compliance. The enclosed flare is equipped with a calibrated landfill gas flow meter to continuously meter and record total landfill gas flared.

§§ 60.757 & 60.758 - Reporting and Recordkeeping Requirements

The applicable requirements of these sections are fulfilled by submission to the APCD for review and approval the measurements and records required under the approved Surface Monitoring, Maintenance and Recordkeeping Plan ("SMMR Plan").

Compliance Status: In compliance.

§ 60.759 - Specifications for Active Collection Systems

This project uses an active collection system. This section specifies the requirements of acceptably designed systems.

Compliance Status: In compliance. The Active Collection System Design Plan prepared by EMCON,

dated 6/17/97 was determined by the APCD to fulfill these requirements.

3.3 Compliance With Applicable State Rules And Regulations

The following provisions of the California Health & Safety Code apply to the project:

- ⇒ California Code of Regulations, Title 17 - Section 42301.2 (Offset Requirements; Installation of Required Devices/Techniques): This section does not allow the APCD to require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of an emission control device or technique used to comply with a district, state, or federal emission control requirement. Because this project is being undertaken to bring the Tajiguas Landfill operations into compliance with the federal NSPS, Subpart WWW, and thereby capture and control existing fugitive organic landfill gas emissions, the project is considered to be an emission control device or technique. This project is, therefore, exempt from any APCD rule requirement to offset project emissions.
- ⇒ California Code of Regulations, Title 17 - Section 85000 (Visible Emissions): This section prohibits the discharge into the atmosphere from any source whatsoever such quantities of air contaminants, except for uncombined water vapor, for a period or periods aggregating more than three minutes in any one hour which is:
 - (a) As dark or darker in shade as that designated as No. 2 on the Ringelmann Chart, as published by the United States Bureau of Mines, or
 - (b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a).

APCD Rule 302 is as stringent as these requirements. Refer to Section 3.4.2 (Rule 302 - Visible Emissions) for a discussion of the project's compliance with this requirement.

- ⇒ California Code of Regulations, Title 17 - Section 70200.5 (Nuisance): This section prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. To date, the APCD has not received any complaints related to operations on the equipment permitted herein. Refer to Section 3.4.2 (Rule 303 - Nuisance) for additional discussion on the project's compliance with this requirement.

3.4 Compliance With Applicable Local Rules And Regulations

3.4.1 Regulation II {Permits} and Regulation VIII {New Source Review}

Regulation II contains a set of rules that define the requirements for permits, exemptions from permit, and permit application processing requirements. Regulation VIII contains the rules that define the

requirements for evaluating and permitting new emission sources such as this project . The following is a rule-by-rule evaluation of compliance for the project:

On April 17, 1997 the APCD Board of Directors approved a revised set of New Source Review ("NSR") rules, including significant revisions to the following rules: 102, 201, 202, 203, 204, 205, and 208; as well as the adoption of the following new NSR rules contained in a new Regulation VIII, that is rules: 801, 802, 803, 804, 805 and 806.

Of these revised and new NSR rules, rules 201, 204, 205, 206, 208, 801, 802, and 803 applied to the project under the original ATC 9788 application. The following is a rule-by-rule evaluation of all these and other applicable rules:

Rule 201 - Permits Required: A permit is required for the equipment specified in this combined ATC/PTO 9788 application. Issuance of this combined ATC/PTO 9788 ensures compliance with this rule.

Rule 204 - Applications: This rule specifies what is required for a complete application for an ATC or PTO. The project's ATC/PTO 9788 application information was determined to be satisfactory and complete according to these rule requirements by the APCD on October 25, 1999.

Rule 205 - Standards for Granting Permits: This rule applies to any application for an ATC or PTO. Section D of the rule specifies that all equipment at any project a facility or source shall operate in a manner that does not emit or cause the emissions of air contaminants in violation of Sections 41700 or 41701 of the California Health and Safety Code. Section D also requires projects to emit in a manner that is consistent with the Air Quality Attainment Plan and Clean Air Plans; and that where applicable project emissions be specified in pounds per million Btu units, ppmv, and pounds per hour.

Section E of this rule authorizes the APCO to require sampling and testing facilities where necessary. This ATC/PTO 9788 is being issued consistent with the requirements of this rule.

Rule 206 - Conditional Approval of ATC or PTO: This rule permits the APCD to issue an operating permit subject to specified conditions. Permit conditions are necessary for the purpose of ensuring that operation of the source complies with all applicable local, state and federal air quality rules, regulations and laws. Section 9 of this permit contains permit conditions necessary for ensuring continued compliance.

Rule 208 - Action on Application - Time Limits: For this ATC/PTO 9788, this rule specifies the requirements for determining application completeness and notification of such. Section E of this rule also specifies the timelines for issuance of this ATC/PTO. Because this facility is considered a "large source" as defined in Rule 102, the APCD must act to approve, conditionally approve, or deny the approval of the equipment listed within the ATC/PTO 9788 application within 120 days of the application completeness determination.

Rule 210 - Fees: This rule establishes the applicable fee requirements. All APCD costs associated with this permit's issuance and continued compliance efforts are assessed on a cost reimbursement basis. To date, the project has paid all required fees.

Rule 801 - New Source Review ("NSR"): This rule's requirements apply to any applicant for a new or stationary source which emits or may emit any affected pollutant. As such, this project is subject to new source review.

This rule also specifies relevant definitions utilized in the evaluation of new or existing sources undergoing NSR. The specific requirements of this rule require that the granting or denial of any ATC or PTO application are based on the rules in force on the date the application is deemed complete. The APCO is also required to deny a project in whole, or in part, unless the new or existing source complies with all applicable APCD rules and regulations. The rule requires that the owner or operator of the new or existing source demonstrate and certify at the time of permit application that all major stationary sources owned or operated by them are in compliance or on a schedule of compliance with all applicable emission limitations and standards.

The permittees have signed the "Notice of Certification" statement in their application form APCD-01 which indicates compliance with the emission limitation certification requirements of this rule. The APCD is not aware of any information which contradicts this certification by the permittees. Lastly, this permit is being processed according to the NSR and other rules in effect on the date this application was determined to be complete.

Rule 802 - Nonattainment Review: This rule applies to all new stationary sources which are subject to Rule 801 and which emit or may emit any nonattainment pollutant or their precursors. Santa Barbara county is in nonattainment with the state ozone, and state PM₁₀ ambient air quality standards. The ATC/PTO 9788 application proposed increases in NO_x and ROC which are ozone and PM₁₀ precursors, SO_x which is a PM₁₀ precursor, and also direct PM₁₀ emissions, therefore the requirements of this rule apply. Based on the project's NO_x, ROC and PM₁₀ potential to emit which is equivalent also to the project Net Emissions Increase ("NEI"), the proposed emission increases of this ATC/PTO 9788 triggered the application of BACT to control these specific emissions as generated by the IC Engine and Afterburner, and the Standby Enclosed Ground Flare. See Section 4 of this permit for a discussion of BACT, and the permit conditions for the enforceable provisions to meet these BACT requirements. The project is anticipated to comply with the requirements of Rule 802 through compliance with these permit conditions.

In addition, due to the proposed increases of NO_x from this project, an AQIA and increment consumption analysis pursuant to the requirements of Rule 803.I was triggered. The results of the AQIA and increment consumption analysis are discussed in Section 6 of this permit and reiterate that discussed in the original ATC 9788 issued in January 1998. Because only small increases in SO_x and PM₁₀ are authorized under this permit from that specified under the original ATC 9788, a new AQIA of project impacts is not deemed necessary. Consistent with APCD policy, this combined ATC/PTO is not subject to a public review process before issuance. A public review process will be required when the operations under this permit are issued the required federal Part 70 permit.

Rule 803 - Prevention of Significant Deterioration: This rule applies to all new stationary sources which, after construction, emit or may emit any attainment pollutants. Also sources which emit or may emit precursors to nonattainment pollutants shall, in addition to the requirements of Rule 802, be subject to the increment protection provisions of Rule 803.

The following summarizes section-by-section the requirements triggered under Rule 803 by this project's NEI and the Tajiguas Landfill's stationary source Entire Source Emissions ("ESE"). The ESE includes

the fugitive dust emissions associated with the landfill earthmoving activities. This ESE does not include emissions associated mobile source fuel combustion.

§803.D - BACT Requirements

The project standby enclosed ground flare's NO_x as NO₂ emissions NEI triggers application of BACT to control this pollutant. This requirement is also triggered under Rule 802. BACT performance for the standby enclosed ground flare was verified during the initial source test in February 1999. Please also refer to Section 4 for a discussion of BACT to control this pollutant.

§803.E - Emission Offsets

This part of Rule 803 is not applicable to this project as no project NEI exceeded the PSD offset threshold.

§803.F - Air Quality Impact Analysis: Modeling

An AQIA was performed during processing of ATC 9788 based on the project's NEI and the Tajiguas Landfill's ESE of NO_x, ROC, CO, TSP and PM₁₀ pollutants. Please refer to ATC 9788 for the discussion of the AQIA results. Issuance of this PTO 9788 does not change the AQIA as the pollutant quantities from the project are no more than those specified within ATC 9788 that triggered an AQIA. This ATC/PTO continues to embody the requirement of ATC 9788 for the project to mitigate increment consumption of NO_x and PM₁₀ by payment of increment fees.

§803.K - Administration

Section K of this rule specifies the Administrative requirements for issuance of ATCs based upon what was required in the Rule 803 analysis. The issuance of this PTO does not require it be transmitted to the California Air Resources Board ("CARB").

3.4.2 Regulation III {Prohibitions}

Regulation III contains a set of rules that set emission and operational standards for a wide range of equipment and processes. The following is a rule-by-rule evaluation of compliance for the project:

- ⇒ Rule 301 - Circumvention: This rule prohibits the concealment of any activity that would otherwise constitute a violation of Division 26 (Air Resources) of the California Health and Safety Code and the APCD rules and regulations. To the best of the APCD's knowledge, the project operates in conformance with this rule.
- ⇒ Rule 302 - Visible Emissions: This rule prohibits the discharge from any single source any air contaminants for which a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade than a reading of 1 on the Ringelmann Chart or of such opacity to obscure an observer's view to a degree equal to or greater than a reading of 1 on the Ringelmann Chart. The only project emission source subject to this rule is the enclosed flare stack. Improperly maintained combustion sources have the potential to violate this rule.

Compliance will be assured by requiring all combustion sources to be maintained according to manufacturer maintenance schedules. See permit condition 10.

- ⇒ Rule 303 - Nuisance: This rule prohibits the causing of a public nuisance due to the discharge of air contaminants. This project, to date, has not caused a public nuisance and should not if properly maintained and operated. It should also not contribute to any additional nuisance that may be associated with the existing landfill's unpaved road travel, earthmoving, and blasting activities.
- ⇒ Rule 305 - Particulate Matter Concentration, Southern Zone: The project is considered a Southern Zone source. This rule prohibits the discharge into the atmosphere from any source particulate matter in excess of the specified concentrations measured in grains per standard cubic foot ("gr/scf"). The maximum allowable concentrations are determined as a function of volumetric discharge, measured in SCFM, and are listed in Table 305(a) of the rule. The only source subject to this rule is the enclosed flare exhaust. Compliance will be assured by requiring all this fired equipment is maintained according to manufacturer maintenance schedules. See permit condition 10.
- ⇒ Rule 309 - Specific Contaminants: Under Section "A" (General), no source may discharge sulfur compounds and combustion contaminants in excess of 0.2 percent as SO₂ (by volume) and 0.1 gr/scf (at 12 percent CO₂) respectively. Sulfur emissions due to the combustion of landfill gas will comply with the SO₂ limit due to the high level of excess oxygen present during combustion of the landfill gas. However, continued compliance will be assured by requiring the enclosed flare system to be maintained according to manufacturer's maintenance specifications. See permit condition 10.

Section "G" (Carbon Monoxide - Southern Zone) prohibits the emission of carbon monoxide ("CO") in excess of 2000 ppmv on a dry basis. February 25, 1999 source tests showed the flare to be emitting only 1.5 ppmv of CO.

- ⇒ Rule 310 - Odorous Organic Compounds: This rule prohibits the discharge of H₂S and organic sulfides that result in a ground level impact beyond the property boundary in excess of either 0.06 ppmv averaged over 3 minutes and 0.03 ppmv averaged over 1 hour. A potential source of H₂S and organic sulfide emissions are from fugitive leaks from piping components collecting and transporting the landfill gas, and from incomplete combustion of the landfill gas. With the implementation of the APCD-approved landfill gas collection Surface Monitoring, Maintenance and Recording ("SMMR") program (see permit condition 21) and properly maintained and operated landfill gas combustion equipment (i.e., the enclosed flare), compliance with this rule should be maintained.
- ⇒ Rule 311 - Sulfur Content of Fuels: This rule limits the sulfur content of fuels combusted to 0.5 percent (by wt) for liquids fuels and 15 gr/100 scf (calculated as H₂S) {or 239 ppmvd} for gaseous fuels burned in south Santa Barbara County. The total sulfur content limit for the landfill gas has been revised upwards in this permit action from 22 to 50 ppmv. However, the revised sulfur content remains significantly less than allowed by this rule. The project is required to monitor landfill gas total sulfur content on a quarterly basis to ensure compliance with this rule. See permit condition 15.

- ⇒ Rule 317 - Organic Solvents: Typically solvents would only be used during maintenance activities, and thus they are expected to be at levels below the thresholds stated in the rule. This permit will require the project to maintain adequate records of all solvent usage. See permit condition 27.
- ⇒ Rule 321 - Solvent Cleaning Operations: This rule sets equipment and operational standards for degreasers using organic solvents. The project has not applied for any degreasers subject to this rule.
- ⇒ Rule 323 - Architectural Coatings: This rule sets standards for many types of architectural coatings. The primary coating standard that applies is for Industrial Maintenance Coatings which has a limit of 340 gram ROC per liter of coating, as applied. The project is required to maintain records to verify that coatings used are in compliance with this rule. See permit condition 27.
- ⇒ Rule 324 - Disposal and Evaporation of Solvents: This rule prohibits any source from disposing more than one and a half gallons of any photochemically reactive solvent per day by means that will allow the evaporation of the solvent into the atmosphere. The project is required to maintain records during maintenance operations to ensure compliance with this rule. See permit condition 27.
- ⇒ Rule 328 - Continuous Emissions Monitoring: This rule details the applicability and standards for the use of continuous emission monitoring systems ("CEMS"). Pursuant to Section C.2, the APCD may require stationary sources that emit more than 5 lb/hr of non-methane hydrocarbons, oxides of nitrogen and sulfur oxides and more than 10 lb/hr of particulate matter to install, calibrate, operate and maintain CEMS for continuously monitoring and recording these pollutant emissions. The project will be permitted to emit NO_x in excess of 5 lb/hr. This rule is not applicable to the flare-only configuration of this project at this time. It does apply to the combined ICE and Afterburner modes yet to be operated.

3.4.3 Regulation V {Hearing Board}

Regulation V contains rules that apply to hearings before the APCD Hearing Board for sources that have a valid Permit to Operate. The following is a Rule 505 compliance evaluation for this project:

- ⇒ Rules 502, 503 and 504: Filing and Content of Petitions: These rules detail the administrative requirements for filing a petition for a variance. The project has not yet applied, or to our knowledge required application for a variance through these rules.
- ⇒ Rule 505 - Breakdown Conditions: This rule describes the procedures that any permitted must follow when a breakdown condition occurs to any emissions unit of the project. To date, no breakdown condition petitions have been filed by the project with the APCD.

3.4.4 Regulation VI {Emergencies}

Regulation VI contains rules that apply to the control of emissions of air contaminants during Stage 1, Stage 2 and Stage 3 air pollution episodes, and air pollution disaster. The following is a Rule 603 compliance evaluation for this project:

- ⇒ Rule 603 - Emergency Episode Plans: Section "A" of this rule requires the submittal of Stationary Source Curtailment Plan for all stationary sources that can be expected to emit more than 100 tons per year of hydrocarbons, nitrogen oxides, carbon monoxide or particulate matter. As the project's facility PTE for all these pollutants will be less than the 100 TPY threshold, a Curtailment Plan was not required to be submitted and approved by the APCD.

3.4.5 Regulation IX {New Source Performance Standards}

This regulation incorporates by reference the federal New Source Performance Standards (Rule 901) and the OCS Air Regulation (Rule 903). Please refer to Section 3.2.2 of this permit for a discussion of the NSPS standards applicable to the project's Gas Plant.

3.4.6 Regulation X {NESHAP}

This regulation incorporates by reference the federal National Emission Standards for Hazardous Air Pollutants (Rule 1001). There are no processes associated with this project that are subject to any applicable NESHAP.

3.4.7 Regulation XIII {Part 70 Operating Permits}

This regulation applies to any source that qualifies as a Part 70 source. Part 70 permitting does apply to the Tajiguas Landfill stationary source pursuant to 40 CFR, Subpart WWW requirements. This permit is not being issued, nor does it fully address compliance with Part 70 permitting requirements. A separate Part 70 permit application was submitted by NEOT, MMTE, and SBCPW in January 2000. That application is currently under review for processing as a Part 70 permit. Issuance of a Part 70 permit is anticipated to occur in the Summer of 2000.

3.5 Permit Compliance Review

During the Source Compliance Demonstration Period ("SCDP"), the APCD confirmed that the project was operating in compliance with all applicable permit conditions and assumptions used in the analysis for issuance of the ATC 9788 that applied to the landfill gas collection system and the standby enclosed ground flare operations.

4. ENGINEERING EVALUATION

4.1 General

This project, installed at the Tajiguas Landfill, generates air emissions from the following sources:

- The Landfill Gas Collection and Control (Standby Enclosed Ground Flare) Project: Combustion emissions of NO_x , ROC, CO, SO_x , TSP and PM_{10} . The emissions will come from one point source, the Flare exhaust.
- Existing Landfill Operations: There are three basic sources and types of emissions:
 - ⇒ Fuel combustion related NO_x , ROC, CO, SO_x , TSP pollutants associated with mobile (vehicular) sources such as earthmoving equipment, garbage trucks, and light duty vehicle operations within the landfill.
 - ⇒ TSP and PM_{10} pollutants, also known as "fugitive dust" emissions associated with earthmoving, blasting of new fill material "borrow" areas, and disturbed ground areas of the landfill, as well as traffic on the landfill's unpaved roads.
 - ⇒ Fugitive organic gas emissions associated with the aerobic and anaerobic decomposition of the municipal solid waste deposited into the landfill. The existing landfill's organic gas emissions are reduced by approximately at least 60 percent by mass through installation and operation of the Landfill Gas Collection and Control project.

In summary, the project operations authorized under this ATC/PTO generate emissions from the landfill gas control system (the standby enclosed ground flare), but will be reducing the existing landfill's fugitive organic gas emissions through installation of the landfill gas control system. No other existing landfill operating emissions are changed by this project.

4.2 Equipment Specific Review

The scope of this section is limited to a review of the Landfill Gas Collection and Control equipment.

4.2.1 Landfill Gas Collection and Conditioning

This system is comprised of vertical and horizontally oriented wells which will draw the produced landfill gas out of the refuse deposition zones in the landfill. The landfill gas is drawn out of the wells into an above-ground piping system which transmits the gas to a centralized collection point. At the centralized location, there is a 40-50 bhp electric motor driven blower that creates the suction pressure on the wells and gas collection piping system such that the landfill gas is drawn out of the landfill. After the gas exits the blower, the gas enters a scrubber and filters where entrained and condensed liquids and particulate are scrubbed out prior to combustion of the gas in the Afterburner/Flare and IC engine. The landfill gas collection system is required to be designed, maintained, monitored and operated to comply with the federal NSPS, Subpart WWW. As such, this permit conditionally requires the use of a Surface Monitoring, Maintenance, and Recording Plan ("SMMR" Plan – Condition No. 21), an Active Collection System Design Plan and Updates (Condition No. 22); and requirements to monitor the Active Collection Systems Operations and report Exceptions to the Subpart WWW operating requirements (Condition Nos. 23 and 24).

The basic elements of these operating plans include monitoring and recordkeeping of the following key landfill gas collection system parameters:

- A landfill ground cover methane emissions monitoring program. This will determine if adequate and properly placed landfill gas collection wells are installed to fully collect landfill gas emissions. It will also monitor the landfill's ground cover for cracks and other defects, and repair any such defects that could create excessive direct-to-atmosphere leaks of landfill gas; and
- Monitoring each landfill gas collection well for temperature, as well as its oxygen, and nitrogen content. This ensures that the landfill is not "aerobicized" to prevent the possibility of initiating an underground landfill fire, or killing the anaerobes which generate the methane from the deposited refuse.

4.2.2 The "Standby" Enclosed Ground Flare

This emission unit is authorized to burn up to 2000 SCFM of landfill gas (equivalent to 54.5 MMBtu/hr), representing a 25% increase from that authorized under ATC 9788. However, a higher landfill gas burn rate will occur, up to about 43 MMBtu/hr as opposed to the Afterburner mode at about 10 MMBtu/hr. The combustion temperature is slightly higher in this mode; a setpoint temperature of 1600 °F is used, rather than the 1550 °F temperature setpoint in the Afterburner mode. Temperature control on this unit controls the amount of fuel delivered to the combustion chamber. Similar to the IC engine/Afterburner unit above, emissions from this equipment unit are calculated as follows:

$$ER = EF \times FPP \times HHV$$

where:

ER	=	emission rate (lb/unit time period, i.e.: hrs, day, qtr, yr)
EF	=	pollutant specific emission factor (lb/MMBtu) {different than IC engine/Afterburner unit's factors}
FPP	=	gas flow rate per operating period (SCF/unit time period)
HHV	=	landfill gas fuel high heating value (Btu/SCF)

4.3 Other Emission Sources

4.3.1 Landfill Operations - Fugitive Organic Gas Emissions

The uncontrolled fugitive organic gas emissions that are produced by the landfill are projected to be reduced by approximately 60 percent in mass (about 206 tons per yr) by operation of the landfill gas collection system of this project. A residual ROC fugitive organic gas emission rate of approximately 137 tons per year will continue to occur even after the collection system is installed and operated. In addition, the toxic impact of the fugitive organic gas emissions from the landfill will be significantly reduced (by approximately 60 percent) by this project, even when the toxic impact associated with the new Afterburner/Enclosed flare emission point that does emit certain toxics is considered (see Section 6). The residual uncontrolled landfill fugitive emissions are evaluated within this permit, and contribute to

the Tajiguas Landfill's stationary source emissions for evaluation within APCD rules and regulations, but are not considered to be this project's responsibility. Rather, the residual fugitive emissions remain the responsibility of Santa Barbara County, the owners of the Tajiguas Landfill.

4.3.2 Landfill Operations - Fugitive Dust Emissions

This project does not change the quantity these emissions (114.8 tons per year of TSP and 41.3 tons per year of PM₁₀) produced primarily from the earthmoving activity and disturbed ground areas of the landfill. These emissions have been previously analyzed in the July 1998, Environmental Impact Report ("EIR") prepared for a small increase in the landfill's capacity and height.¹ That EIR's estimate of these emissions is considered to be reasonably accurate. These emissions have been considered within this permit to contribute to the Tajiguas Landfill's stationary source emissions for evaluation within APCD rules and regulations, but are not considered to be this project's responsibility. Rather, the fugitive dust emissions are the responsibility of Santa Barbara County, the owners of the Tajiguas Landfill.

4.3.3 Landfill Operations - Mobile Source Emissions

This project does not propose to change the quantity of these emissions produced primarily from the earthmoving and refuse handling activities in the landfill. These emissions have been previously analyzed in the July 1988 EIR for the proposed increase in the landfill's capacity and height.² The EIR estimated the pollutant emissions in tons per year that are associated with this activity as follows: ozone precursors (NO_x & ROC) at 15.4; TSP/PM₁₀ at 1.29; SO_x at 1.55; and CO at 3.99. This EIR estimate is considered to be reasonably accurate at this date. These emissions are also not considered to contribute to the Tajiguas Landfill's stationary source emissions for evaluation within APCD rules and regulations.

4.4 Best Available Control Technology (BACT)

The standby enclosed ground flare project's specified net emission increases of NO_x, and ROC triggered the requirement, under Rule 802, to install BACT for these pollutants.

BACT Determination Summary

Table 4.1 summarizes the BACT performance standards which have been determined to apply to the equipment proposed for use in this project. Only Non-attainment pollutant BACT (or "NAR - BACT") determinations were triggered for this project, as no project pollutant levels exceeded the Rule 803 PSD BACT trigger levels. All of the proposed project BACT standards can be considered to meet or exceed currently documented Achieved-in-Practice ("AIP") BACT or LAER standards for this class and rating of equipment. These BACT standards should be viable for the life of this project. A more detailed discussion of the standby enclosed ground flare BACT determination follows, including references to applicable BACT performance standards prepared by other air quality control agencies for similar emission units (see Section 10 - Attachments).

¹ McClelland Engineers, Inc., Final Environmental Impact Report and Addendum for the Tajiguas Landfill Expansion (SCH 86111202), July 1988, pp. V-112 and V-113.

² Ibid., p. V-105.

4.4.1 Standby Enclosed Ground Flare

BACT Selection and Evaluation

Evaluation of the proposed NO_x and ROC pollutant BACT included a review of SCAQMD, BAAQMD, and SJVUAPCD BACT databases applicable to this class and rating of equipment, that is a Non-hazardous Landfill Enclosed Ground Flare. This permit's BACT evaluation comparison for this equipment can be found in Section 10.4 of this permit. The proposed BACT standards for this equipment were established consistent with the ATC 9788 application and found to meet Achieved-in-Practice ("AIP") standards. The BACT performance standards applicable to this equipment unit are documented and summarized in Table 4.1 below.

BACT Effectiveness

This standby enclosed ground flare under ATC 9788 was intended to be operated only when the IC engine electrical generation equipment unit was shutdown, typically for maintenance. Currently, since standby enclosed ground flare operations began in November 1998, the IC engine equipment has not been installed or operated. It is anticipated that the IC engine will be installed and begin to operate around July 2000. Accordingly, this project configuration was not expected to operate in this mode more than 5% of the time on an annual basis (approximately 400 hours at the most); it was permitted however to be capable of operating continuously all year (8760 hours/year). According to the permit application, this standby enclosed ground flare will achieve the BACT performance standards from 100 percent through 30 percent of its maximum rating of 2000 SCFM. In the standby mode, the usual landfill gas load will be about 1600 SCFM, or 80 percent of the maximum design; thus, an appropriate BACT operating regime appears likely.

BACT During Non-Standard Operations

The applicant has identified only one non-standard operations scenario for this unit: startups and shutdowns of the enclosed flare. The flare-only operations is expected to comply with BACT for all operations except its startup period (i.e., "light-off").

Operating Constraints

The primary process variables which will affect the BACT performance of this unit, are the combustion chamber residence time, and the combustion temperature. The residence time requirement will be met by ensuring the enclosed flare does not flare a gas flow rate in excess of its design and permit limit (2000 SCFM) of landfill gas (see Table 5.1). The combustion temperature requirement will be met by ensuring the enclosed flare's temperature controller works and is maintained properly, and through monitoring of records of the combustion temperature during operations.

The APCD has calculated a residence time for this equipment unit when operating at its design maximum landfill gas flow rate of 2000 SCFM. At 1.25 seconds, the residence time exceeds that specified in the AIP BACT standards documented in Section 10.4 of this permit. This calculation is shown in Section 5, Table 5.4 of this permit.

3

Continuously Monitored BACT

No additional Continuous Emissions Monitoring ("CEM") equipment is warranted from that already identified for the IC engine/Afterburner project configuration. All hourly emission rates permitted for this equipment unit are below the Rule 328 thresholds for CEM consideration.

Source Testing Requirements

Because the expected operational activity of the equipment unit was going to be limited (i.e., less than 5 percent per year), the source testing requirements were limited in ATC 9788 to an initial source test of the equipment during SCDP and triennial source testing thereafter at near maximum permitted capacity utilization rates (i.e., 1600 SCFM of landfill gas flow). However, as specified in ATC 9788, if the unit appeared to be operating significantly more than 5 percent of the time on an annual basis, the APCD reserved the right to require more frequent source testing (e.g., annual frequencies). Because this has actually been the case, this ATC/PTO includes a new source test trigger for this equipment based on its annual usage. If the annual usage of the Standby ground flare exceeds 438 hours per year, a source test of that Flare mode is required annually.

Compliance Averaging Times

Table 4.1 identifies ppmvd limits for NO_x and ROC emissions from this unit. These ppmvd limits can be used to instantaneously assess compliance with the BACT performance specifications for these pollutants. In addition, for ROC emissions the residence time and combustion temperature requirements provide an instantaneous assessment of BACT performance for this pollutant. Note, ATC 9788 also identified a PM_{10} BACT standard for the standby enclosed ground flare mode. This has been dropped in this ATC/PTO because for the ground flare the BACT threshold for PM_{10} is not genuinely triggered under Rule 802.

Alternative lb/MMBtu BACT specifications are also identified for NO_x and ROC (as hexane) equivalents which will be verified during the source testing of this equipment.

Table 4.1 - BACT Summary: Standby Landfill Gas Enclosed Flare (>24 MMBtu/hr High Heating Value Input)

Pollutant	Control Technology	Emission Limit / Performance Standard	Verification / Recordkeeping Requirements
NO _x	1) Burner design.	<u>Emission Limit:</u> A) 44 ppmv NO _x in Flare exhaust, corrected to 3% exhaust oxygen. <u>Performance Standard:</u> B) 0.060 lb/MMBtu of landfill fuel combusted in Flare.	A) & B): Initial and then triennial emissions source testing of Flare exhaust to atmosphere.
ROC	1) Same as for NO _x controls described above; 2) Enclosed flare operating at a 1600 °F temperature setpoint and 1.25 second residence time.	<u>Emission Limit:</u> A) 19 ppmv ROC as hexane, corrected to 3% exhaust oxygen in Flare exhaust. <u>Performance Standard:</u> B) 0.048 lb/MMBtu of total landfill fuel combusted in Flare.	A) Continuous monitoring and recording of Flare temperature; and, B) Initial and then triennial emissions source testing of Flare exhaust to atmosphere.

Notes:

- 1) All the above-listed BACT standards apply to all operations of the Enclosed Flare, except during pilot light-off and automatic equipment shutdowns from, for example, loss of flare flame.

4.5 Emissions Monitoring

This project's equipment will not be required to install Continuous Emissions Monitor Systems ("CEMS"), unless warranted by demonstrated operational problems leading to excess emissions from that stated under this permit. In lieu of CEMS, the APCD believes that because of the robust nature of the emissions control system in this project, specific continuous process parameter monitoring and annual/triennial source testing of the standby enclosed ground flare equipment provides assurance that excess emissions will not routinely or excessively occur. Table 4.3 below summarizes the specific continuous process parameters that must be monitored for the standby enclosed ground flare operations mode.

The APCD reserves the right to require a CEMS in the future, along with telemetry of its information to the APCD Data Acquisition System ("DAS"), if emissions are found to be out of compliance during source tests, or if specific regulations mandate such. Any future CEMS must meet the applicable requirements set forth in APCD Rule 328 and in 40 CFR Part 51 and Part 60.

Table 4.2 – Emissions Monitoring Program

Emission Source #) Emission Control Parameter	Monitoring Method	Monitoring Frequency (minimum)
Standby Enclosed Ground Flare		
A) Stack Temperature	1) Thermocouple calibrated according to <i>Process Monitor Calibration and Maintenance Plan</i> specified in Condition No. 33. Temperature recorded to circular chart.	1) Continuous
B) Landfill Gas Flow to Enclosed Ground Flare	1) Flow meter. Flow meter output recorded onto circular chart.	1) Continuous
	2) Quarterly landfill gas analysis as specified in Condition No. 32.	2) Quarterly Analysis

4.6 Source Testing, Sampling, Monitoring And Meter Calibration

Source testing, sampling, monitoring and meter calibration are required in order to ensure compliance with permitted emission limits, Prohibitory rules, NSPS, control measures and the assumptions that form the basis of this operating permit.

4.6.1 Source Testing

The project is required to follow the APCD Source Test Procedures Manual (May 24, 1990 and all subsequently approved updates). The parameters to be source tested annually (unless otherwise specified) are listed below, and include more specific requirements as identified in Tables 4.3. The APCD may require additional source testing if problems develop or if unique circumstances occur that warrant special testing. The following emission points and control/monitoring systems are required to be source tested:

- ⇒ Standby Enclosed Ground Flare Exhaust (NO_x , ROC, NMOC, and CO)

Thirty (30) days before each annual (or triennial) source test, the project shall submit a Source Testing Plan to the APCD consistent with the requirements of the APCD's Source Test Procedures Manual. The plan must be approved by the APCD prior to the source test. This plan shall specify the following:

- ⇒ A detailed description of the source testing program, including the proposed operating loads and conditions.
- ⇒ The location of each sampling port, including diagrams.
- ⇒ A detailed description of the source testing methodology, including sampling and analysis procedures and calculation methods.
- ⇒ The source testing schedule.
- ⇒ The quality assurance procedures to be followed.
- ⇒ The format for reporting source testing results to the APCD.

Once the source test plan has been approved by the APCD, the project shall notify the APCD in writing at least 10 days before each source test. The notification shall include the scheduled dates(s) for testing. Testing may be observed by the APCD or a designated agent.

The test results shall be submitted to the APCD within 45 days of test completion, or earlier if the APCD determines special circumstances warrant a more expeditious submittal. The following information must be included in the report:

- ⇒ A summary of emission test results by both volume (i.e., ppmv) and mass (i.e., lb/hr).
- ⇒ A comparison of the emission test results with permit limitations.
- ⇒ A comparison of the emission test results to CEM results where applicable (e.g. when a relative accuracy test is performed).
- ⇒ A summary of the process data collected during the source test.
- ⇒ A discussion of any measured parameters that do not meet permit limitations, the procedures proposed to correct the problem, and the schedule for re-testing.

- ⇒ A discussion of the QA/QC activities relative to the results of the testing.
- ⇒ A certification of the accuracy of the testing methods and results signed by the project and the testing contractor.
- ⇒ The raw data and calculation sheets as appendices.

4.6.2 Sampling

At a minimum, the process streams below are required to be routinely sampled and analyzed on a quarterly basis (except where noted):

- ⇒ Treated Landfill Gas (scrubbed of condensate, free water and particulate): Sample taken at Landfill Gas feed common header inlet to standby enclosed ground flare. Analysis for NMOC, ROC (by EPA Method 25), hydrogen sulfide, total sulfur composition, high and lower heating values.
- ⇒ Landfill Gas Condensate: ROC content

As necessary to ensure compliance with this permit and applicable rule and regulations, the APCD may require the project, by written notice, to sample additional process streams in a manner and frequency specified by the APCD. All sampling and analyses are required to be performed according to APCD-approved procedures and methodologies. Typically, the appropriate ASTM methods are acceptable. It is important that all sampling and analysis be traceable by chain of custody procedures. The project source test plan shall be amended to include the sampling and analytical methods required to obtain the process stream data stated above.

Table 4.3 - Source Test Parameters

Equipment Unit	Emission & Test Point	Pollutants or Parameters	Test Methods	Tested Annually {if operations exceed 438 hours per year}	Tested Triennially
				(yes = X)	(yes = X)
Standby Enclosed Ground Flare Stack	NO _x	ppmvd & lb/hr	EPA - 7E	X	X
	CO	ppmvd & lb/hr	EPA-10	X	X
	ROC	ppmvd & lb/hr	EPA - 18	X	X
	NMOC	ppmvd & lb/hr	40CFR §60.754	X	X
	Fuel Flow Rate	MMSCF/hr	Calibrated Flow Meter	X	X
	Stack Oxygen	%	EPA-3	X	X
	Fuel Sample	Btu/SCF (HHV basis); "F" Factor	ASTM	X	X
	Stack Flow Rate	SCFM	EPA 1-4 or Method 19	X	
	Stack Temperature	°F	Calibrated Meter	X	X
Landfill Gas Fuel Supply (scrubbed gas)	Gas Flow Rate	MMSCF/hr	Calibrated Flow Meter	X	X
	Fuel Sample	Btu/SCF (HHV basis); "F" Factor	ASTM	X	X
	Total Sulfur Content	ppmv	ASTM	X	X
	NMOC	ppmvd & lb/hr	40CFR §60.754	X	X

Notes:

- 1) All pollutant ppmvd to be reported to a corrected stack or exhaust excess oxygen of 3% and dry basis.
- 2) NMOC ppmvd and mass emission rate, expressed as hexane equivalents.
- 3) ROC is non-ethane NMOCs.
- 4) Alternative testing methods may be accepted by the APCD on a case-by-case basis.

4.6.3 Monitoring

In many instances, ongoing compliance beyond a single (snap shot) source test is assessed through process monitoring systems. Examples of these monitors include: engine hour meters, fuel usage meters, mass flow meters, flare gas flow meters and hydrogen sulfide analyzers. Once these process monitors are in place, it is important that they be well maintained and calibrated to ensure that the required accuracy and precision of the devices are within specifications. At a minimum, the following process monitors will be required to be calibrated and maintained in good working order:

- ⇒ Total Scrubbed Landfill Gas Fuel Flow Meter/Recorder
- ⇒ Afterburner/Enclosed Flare Incineration Zone Temperature Indicator(s) and Recorder
- ⇒ Landfill Gas Condensate Flow (gallons) Metering/Recording Equipment

As necessary to ensure compliance with this permit and applicable rule and regulations, the APCD may require the project, by written notice, to install additional process monitors. Further, the APCD may require the project, by written notice, to expand the list of existing plant process monitors detailed in the list above.

4.6.4 Meter Calibration

To ensure that appropriate calibration and maintenance procedures are applied to the metering specified in Section 4.6.3 above, a Process Monitor Calibration and Maintenance Plan is required from the project (see permit conditions). This Plan takes into consideration manufacturer recommended maintenance and calibration schedules, or where manufacturer guidance is not available, the recommendations of comparable equipment manufacturers and good engineering judgment are utilized.

5. PROJECT EMISSIONS

5.1 General

This permit analyzes on the emissions associated with the standby enclosed ground flare mode when burning 2000 SCFM of landfill gas containing up to 50 ppmv of total sulfur content. The other project operating mode authorized under ATC 9788 is not analyzed or authorized under this ATC/PTO because the IC engine has not yet been installed and tested under a SCDP for compliance with ATC 9788 emission limits and conditions.

5.2 Landfill Gas Emission Factors

The permittee has adjusted the enclosed ground flare's emission factors in this ATC/PTO 9788 from that specified under the original ATC 9788 application. The emission factors for NO_x, ROC, and CO were revised downward to balance out the proposed increases in landfill gas flow (i.e., 1600 SCFM to 2000 SCFM). The SO_x emission factor was revised to account for the increase total sulfur content in the landfill gas (i.e., 22 ppmv to 50 ppmv) discovered during ATC 9788's SCDP. The table below summarizes the changes in emission factors:

Emission Factor	As Listed in ATC 9788 Issued January 1998 (lb/MMBtu)	As Applied For and Specified in this ATC/PTO 9788 (lb/MMBtu)
NO _x	0.060	0.048
ROC (as C ₆ equivalents)	0.048	0.038
CO	0.290	0.232
SO _x (as SO ₂)	0.008	0.019
TSP	0.008	0.008
PM ₁₀	0.008	0.008

Hourly mass emission rates and landfill gas combustion rates were utilized to verify the permittees' proposed lb/MMBtu emission factors. All applicant specified criteria pollutant emission factors in

lb/MMBtu were found acceptable, as can be confirmed by comparison with the February 25, 1999 source test results in Section 10.5 of this permit.

Another important note in the utilized emission factors, is in the calculation of equivalent pollutant ppmv limits for certain criteria pollutants, such as NO_x, ROC (as hexane equivalents), and CO. Because landfill gas contains a significant quantity of inert CO₂ gas, a landfill gas specific "expansion factor", or "F-factor" was derived. This derivation is documented in Section 10.2 of this permit. It utilizes the 40 CFR "natural gas" specified default F-factor, and inflated it by 1/2 of the landfill gas volume that generates 1.0 MMBtu of gross heat release, to account for the approximate 50 volume percent of landfill gas that is inert CO₂.

In Section 10.2, other formulae are also presented which were used to convert lb/MMBtu emission factors to ppmvd. It is also important to note that all ppmvd limits in this permit are expressed to a 3 percent excess oxygen content basis. This excess oxygen reference point correlates with the Landfill Gas Control Subpart WWW specifications.

5.3 Permitted Emission Limits - Emission Units

Table 5.1 specifies the allowed operational limits of the standby enclosed ground flare authorized under this permit.

For the standby enclosed ground flare, the mass emissions rates of these unit's criteria pollutants are calculated as follows:

$$\text{lb/hr} = \text{EF} * \text{Q} = \text{lb/MMBtu} * \text{MMBtu/hr}$$

$$\text{lb/day} = \text{lb/hr} * \text{hr/day}$$

$$\text{tons/qtr} = \text{lb/hr} * \text{hr/qtr} \div 2000 \text{ lb/ton}$$

$$\text{tons/yr} = \text{lb/hr} * \text{hr/yr} \div 2000 \text{ lb/ton}$$

where:

EF = the pollutant specific emission factor shown in Table 5.4 for the equipment unit.

Q = the permitted maximum hourly fuel high heating value heat input rate for the equipment unit in lb/MMBtu in Table 5.1.

See Table 5.1 for the authorized gross hourly heat release rate (MMBtu/hr), and the daily, quarterly and annual operating hour limits for each equipment unit. See Table 5.4 for the lb/MMBtu emission factors.

5.4 Permitted Emission Limits - Facility Totals

Tables 5.1 through 5.4 specify the equipment specifications, short and long-term emission limits, and emission factors utilized in calculating the emission limits for this project.

5.5 Exempt Emission Sources

Table 5.5 documents the exempt "stationary-type" emission sources and emissions as associated with the Tajiguas Landfill and this Landfill Gas to Energy project permitted through this permit. When Table 5.5 is added together with the project's Table 5.2 and 5.3 permitted emission limits constitutes the Tajiguas Landfill's "entire stationary equipment emissions" (or "ESE").

Table 5.1- Project Emissions Unit Equipment Specifications

Tajiguas Landfill Gas to Energy Project Control Equipment Description															
Item	Make/Model	SERNO Or Tag #	Used As	Equipment Specifications				Operating Limitations					Fuel Properties		
				Max. Output		Emission Controls:	BSFC ⁽²⁾	On-line Time			Fuel Use (MMBTU)			HHV	Tot. Sulfur
				Data	Units			(hr/day)	(hr/qtr)	(hr/yr)	(per day)	(per qtr)	(per yr)	Btu/SCF	(ppmv)
Standby Operations Mode - Flare Only															
1	LFG Specialties / ERA 84018	TBD in SCDP	Standby Ground Flare	54.60	MMBtu/hr	Burner/Temp	N/A	24	2190	8760	1310.40	119574	478296	455	50
				2000	SCFM of LFG										
Notes: (1) The stated IC engine BHP in this table is the maximum permitted output of the engine in this service. The actual maximum manufacturer rating for this unit is 4314 BHP. (2) Units of IC Engine BSFC are Btu/bhp-hr, where Btu is based on fuel's high heating value.															

Table 5.2 - Project Hourly and Daily Emissions

Hourly and Daily Emission Limitations												
Item ⁽¹⁾	NO _x		ROC ⁽²⁾		CO		SO _x		H ₂ S		NMOC	
	lb/hr	lb/day	lb/hr	lb/day	lb/hr	lb/day	lb/hr	lb/day	lb/hr	lb/day	lb/hr	lb/day
Standby Operations Mode - Flare Only	2.62	62.9	2.07	49.8	12.67	304.0	1.01	24.3	0.44	10.5	0.44	10.5
Notes: (1) Keyed to the Equipment List in Table 5.1. (2) Mass emissions for NO _x as NO ₂ ; SO _x as SO ₂ (3) Exhaust ROC for all emission units in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.												

Table 5.3 - Project Quarterly and Annual Emissions

Quarterly and Annual Emission Limitations												
Item ⁽¹⁾	NO _x		ROC ⁽²⁾		CO		SO _x		H ₂ S		NMOC	
	TPQ	TPY	TPQ	TPY	TPQ	TPY	TPQ	TPY	TPQ	TPY	TPQ	TPY
Standby Operations Mode - Flare Only	2.9	11.5	2.3	9.1	13.9	55.5	1.1	4.4	0.5	1.9	0.5	1.9
Notes: (1) Keyed to the Equipment List in Table 5.1. (2) Mass emissions for NO _x as NO ₂ ; SO _x as SO ₂ (3) Exhaust ROC for all emission units in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.												

Table 5.4 - Project Emission Factors**Equipment Emission Factors**

Item #	Specification	NO _x	ROC/NMOC	CO	SO _x	TSP	PM10	References
Standby Enclosed Flare #3	g/bhp-hr	n/a	n/a	n/a	n/a	n/a	n/a	Standby Flare em. facs. per ATC 9788 application Calculated per ATC 9788 Eng. Eval analysis, dry basis
	lb/MMBtu	0.048	0.038	0.232	0.019	0.008	0.008	
	ppmvd @ 3%	35	15	277	n/a	n/a	n/a	

lb/MMBtu to ppmvd Constants @ 3% excess oxygen (See Section 10.2)

	NO _x	ROC/NMOC	CO
K _{LPG}	726.4	388.6	1193.2
	as Hexane		

Landfill Gas Fuel "F" Factor Derivation, dry basis ("LFG-F")

LFG-F = 40CFR "F" factor + 50% of LFG volume that generates 1.0 MMBtu which is inert.

40 CFR "F" Factor for natural gas: 8608 @ 0% oxygen and 60 °F

50 % Inert LFG Volume @ 1.0 MMBtu: 1099

LFG-F = 9707 SCF/MMBtu of fuel HHV @ 0% excess oxygen.

LFG-F, wet = 11900 SCF/MMBtu of fuel HHV @ 0% excess oxygen per application backup data.

Afterburner/Flare Residence Time CalculationsResidence Time (sec.) = Combustion Chamber Volume (ft³)/Volumetric Flow Rate @ Actual Conditions (ft³/sec)**Data**

	Flare
Actual Temperature (oF):	1600
Actual Pressure (psia):	14.7
Actual Oxygen Content, wet basis (%):	7.39
Landfill Gas Flow Rate (SCFM)	2000
Heat Release (MMBtu/hr)	54.60
Volumetric Flow @ 0% oxygen, std cond., wet basis (ft ³ /sec)	180.5
Volumetric Flow @ Actual Conditions, wet basis (ft ³ /sec)	1106

Last Thermocouple Location (ft above grade):	36
Burner Exit Location (ft above grade)	8.5
Combustion Chamber Height (ft)	27.5
Combustion Chamber Diameter (ft)	8
Combustion Chamber Volume (ft ³):	1382

	Flare
Calculated Residence Time (sec) @ Actual Conditions	1.25

Table 5.5 - Exempt Emission Sources

Item	Description	NO _x			CO			SO ₂			ROG			TSP			PM10		
		(lb/hr)	(lb/day)	TPY	(lb/hr)	(lb/day)	TPY	(lb/hr)	(lb/day)	TPY	(lb/hr)	(lb/day)	TPY	(lb/hr)	(lb/day)	TPY	(lb/hr)	(lb/day)	TPY
1	Earthmoving Fugitive Dust	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	92.17	737.4	111.7	33.18	265.45	40.22
2	Blasting Fugitive Dust	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0	2.56	20.5	0.03	0.92	7.37	0.01
3	Residual Landfill Fugitive Organic Gases	0.00	0.0	0.0	0.00	0.0	0.0	31.35	752.5	137.3	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.0
4	<i>Earthmoving Equipment</i>																		
5	Total Exempt Emissions	0.00	0.0	0.0	0.00	0.0	0.0	31.35	752.5	137.3	94.73	757.8	111.7	34.10	272.8	40.2			

Notes:

- PM10 derived from TSP emissions. Fraction PM10 of TSP is conservatively assumed to be 0.36 per AP-42, Section 13.2.2 - Unpaved Roads
PM10 fraction from AP-42, Section 13.2.3 - Heavy Construction Operations varies, but is closer to 0.20, so conservatively assumed the 0.36 value.
- TSP emissions data obtained from EIR Table V-16 for Tajiguas Landfill height increase permit. Time period 1995-96 data used here.
- Earthmoving daily and annual emissions derived from hourly emissions stated in EIR Table V-16 by multiplying by 8 hours per day and 303 operating days.
- Residual Landfill organic gas emissions based on existing landfill gas emissions reduced 60% in mass by this project.
Data from APCD Rule 341 - Landfill Gas Emission Guidelines Staff Report, September 18, 1997.
- Blasting hourly emissions inflated to daily based on 8 hours of blasting per day, and annual based on only three blast events per year.
- Mass emissions for NO_x as NO₂; SO_x as SO₂

6. AIR QUALITY IMPACT ANALYSIS

6.1 Scope of Review

The standby enclosed ground flare mode emissions do not trigger Rule 802 or 803 requirements to perform an Air Quality Impact Analysis. As such, no reassessment of the AQIA performed under ATC 9788 is performed here. A reassessment of the ATC 9788 AQIA will be performed at the time that a PTO is applied for the operations of the combined IC engine/Afterburner.

However, during the SCDP for the standby enclosed ground flare, an assessment of the toxic emissions produced by its operations was made through source testing. That source test data was used to reevaluate the Health Risk Assessment ("HRA") done under ATC 9788.

6.2 Landfill and Energy Project Health Risk Assessment ("HRA")

Installation and operations of the landfill gas collection and control systems as specified in this permit was analyzed for the health risk associated with the new "point" source of toxic emissions from the standby enclosed ground flare stack. This stack's emissions may contain constituents that are known or suspected to be carcinogenic, or otherwise toxic to humans. It is important to note that the uncontrolled landfill fugitive organic gas emissions also contain similar toxic species which are emitted in larger mass quantities than those emanating from the standby enclosed ground flare stack. The standby enclosed ground flare's mass emissions rate of toxic emissions are less by a factor of ten than the landfill's originally estimated uncontrolled fugitive organic gas emission toxics (see Section 10.4).

However, as a byproduct of combusting landfill gas in the standby enclosed ground flare, small amounts of different types of toxic species with different risk profiles may be created. Therefore, to provide an appropriate health risk perspective to this project, the HRA has quantified the risk associated with the uncontrolled landfill and compares that risk with the post-controlled landfill. This HRA also limited its evaluation to stationary sources of emissions, such as this project and the landfill's fugitive organic gas emissions. The HRA does not consider health risk associated with the existing mobile source emissions at the landfill (e.g., the earthmoving equipment operations), primarily because such activity is not proposed for change through this permit.

Only the standby enclosed ground flare operating mode was analyzed for health risk. The analysis performed compares the toxics mass emissions projected in ATC 9788 for the standby enclosed ground flare only mode with the actual toxic emissions measured during the February 1999 source test (see Section 10.4). The comparison shows that the actual toxic emissions are less than projected in ATC 9788. This is most likely because the standby enclosed ground flare has a higher degree of organic compound destruction efficiency than was relied on in the ATC 9788 analysis. In conclusion, it is clear that the actual standby enclosed ground flare toxic emissions present no more risk than that estimated under ATC 9788.

Table 6.1 summarizes the findings of the HRA performed using the site-specific landfill gas toxics concentration and mass emission data provided by the applicant, and the ISCST3 dispersion model of the emission plumes, and the ACE2588 risk assessment model. The toxic mass emissions and afterburner

stack parameters used in these models can be referenced in Section 10.4. Table 6.1 indicates that the project has reduced the landfill's toxic risk profile by at least 71%, and also below a 10 cases in 1 million "acceptable risk threshold". In accordance with APCD policy, project's with a health risk below 10 cases in 1 million do not trigger additional Toxics-BACT (or "T-BACT") requirements.

Table 6.1 - Landfill and Energy Project Health Risk Assessment Results

Landfill Configuration	Associated Health Risk (a)
<u>Uncontrolled Landfill Operations (Before June '98)</u>	
<i>Emissions Mode:</i>	
Fugitive Organic Landfill Gases	17.5
<u>Energy Project</u>	
<i>Emissions Modes:</i>	
Standby Enclosed Ground Flare Stack	<1
&	
Residual (Reduced) Landfill Fugitive Organic Gases	4
⇒ Cumulative Project Health Risk (b)	($<1+4$) = <u>5</u>
	(71% less than Existing Landfill Operations)

Table 6.1 Notes:

- (a) Health Risk here is as an indicator of excess cancer risk, in cases per million population. Stated cancer risk is based upon continuous exposure to a configuration's emission plume over an assumed seventy year lifetime period.
- (b) The direct addition together of a "point source" (i.e., the Afterburner stack) and an "area" source (i.e., the Landfill fugitives) is gauged to be a conservative (i.e., overstated) assessment of the project's impact.

6.3 Vegetation And Soils Analysis

This analysis was not required for this project.

6.4 Potential To Impact Visibility and Opacity

This analysis was not required for this project.

6.5 Public Nuisance

This project reduces the existing landfill's fugitive organic gas emissions by approximately 60% by mass. Raw landfill gas emissions to the atmosphere are known to contain constituents that can cause nuisance odors in the vicinity of the landfill. Because this project reduces fugitive emissions, the potential for odors are reduced from this emission pathway. The project afterburner stack, this device will be operated consistent with BACT requirements for ROC control. These requirements specify adequate landfill gas combustion temperature and residence time that should ensure nearly complete combustion of the landfill gas odorous constituents to carbon dioxide, water vapor, and other significantly less odorous species than the raw landfill gas. Overall, the project reduces nuisance odors as compared to the previous uncontrolled landfill configuration.

6.6 Ambient Air Quality Monitoring

None of the new project's emissions triggered the requirement to perform pre-construction, or post-construction monitoring of the surrounding ambient air quality. No new ambient air quality monitors were installed by this project.

7. OFFSETS AND CLEAN AIR PLAN CONSISTENCY

7.1 Offsets

Under APCD Rule 802 and 803, projects which generate net emission increase ("NEI") in excess of these rules "offset" thresholds are required to secure emission offsets through the reduction of other existing emissions sources within the air basin. These emission offsets must be real, quantifiable, surplus to the project's proposed NEI, and permanent such that they last for the life of the project.

However, the project permittees petitioned the APCD to have this project classified as an "emissions control project" to comply with the federal NSPS for landfills (40 CFR, subpart WWW). Pursuant to California Health and Safety Code, Section 42301.2, the APCD is not allowed to require emission offsets for any emission increase that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement. Section 42301.2 does contain language which does not prohibit the APCD to require emission offsets if there is a modification that results in an increase in capacity of the unit being

controlled. The unit capacity of consideration here would be based on the landfill's capacity. This project is not proposing any change in the landfill's existing permitted capacity.

The APCD has evaluated the permittees' petition that the proposed project's NEI of NO_x are exempt from offsets through Section 42301.2. The APCD finds that this project can be considered an emission control project to comply with the applicable NSPS, and furthermore, that there is not any proposed increase in capacity of the Tajiguas Landfill through this permit from that authorized under the existing land use permit for the Tajiguas Landfill. Therefore, the project as specified under this permit is exempt from having to secure emission offsets for its NO_x NEI.

7.2 Clean Air Plan Consistency

The APCD's 1994 Clean Air Plan ("CAP") identified that installation of a landfill gas collection and control system for the Tajiguas Landfill fugitive ROC emissions would generate significant ROC emission reductions. The proposed project, by fully complying with the Subpart WWW, NSPS requirements, is expected to generate emission reductions which are consistent with the 1994 CAP.

The CAP also identified secondary pollutant emissions as being mitigated fully through the APCD's New Source Review rule including use of BACT and emission offsets if triggered. The project has installed BACT to minimize project NO_x emissions from the standby enclosed ground flare, so this is consistent with the CAP. However, as discussed in Section 7.1 above, emission offsets for NO_x are technically triggered through Rule 802 but will not be required of this project because of the petitioned for exemption through Section 42301.2. The absence of project-secured emission offsets for these pollutants is not considered to be inconsistent with the CAP because the Section 42301.2 exemption was adopted into law in 1996, subsequent to adoption of the relevant CAP.

8. CEQA/LEAD AGENCY PERMIT

8.1 CEQA Requirements

Pursuant to the *California Environmental Quality Act* and the *Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District* (October 1995), the issuance of ATC No. 9788 was subject to CEQA review by the APCD. In regard to CEQA, the Santa Barbara County Planning and Development Department acted as the lead agency for this Landfill Energy project as described in application 95-CP-046(ZA), to be operated in the existing Tajiguas Landfill property (APN 081-150-019, -026). On November 21, 1995 the Santa Barbara County Zoning Administrator took the following actions:

- Adopted the required findings for the project specified in Attachment A of staff's report dated October 25, 1995, as modified by staff's memorandum dated November 17, 1995, including CEQA findings; and
- Approved the project, 95-CP-046(ZA), subject to the conditions included as Attachment B of staff's report dated October 25, 1995, as modified by staff's memorandum dated November 17, 1995.

This ATC/PTO 9788 remains consistent with the Lead Agency permit and associated CEQA review summarized above and below.

8.2 CEQA Findings

Pursuant to California Public Resources Code, Section 21151.1(d)(2) this Landfill Energy project was determined to be exempt from environmental review under CEQA. Although exempt from CEQA, the Zoning Administrator found in issuance of 95-CP-046(ZA) that the primary impact from this project would involve changes to air emissions and that these issues would be appropriately addressed through the required APCD permit applications and permit issuance conditions.

This permit's conditions fully reflect the appropriate mitigation of the project's air quality impacts through verified compliance with all federal, state, and local air quality related rules and regulations.

8.3 Lead Agency Permit Requirements

The applicable air quality-related Lead Agency requirements for this project are found on page B-3 of the Conditional Use Permit 95-CP-046(ZA), which read as follows:

"The flare proposed to be used would meet federal regulation for air emissions. The engine(s) selected have the best available control technology (BACT) as determined by the California Air Pollution Control Officers Association (CAPCOA) BACT Clearinghouses. The engine(s) have a destruction efficiency of about 97%. The flare would have a 99% destruction efficiency."

As specified above, all these Lead Agency requirements are fully met through the proposed project equipment and this permit's conditions. It is presumed that the criterion specified above as "destruction efficiency" is in reference to the landfill organic gas destruction efficiency specified within 40CFR, Subpart WWW.

9. PERMIT CONDITIONS

APCD Rule 206 (*Conditional Approval of Authority to Construct or Permit to Operate*) states that the Control Officer may issue an operating permit subject to specified conditions. Permit conditions have been determined as being necessary for this permit to ensure that operation of the project complies with all applicable local, state and federal air quality rules, regulations and laws. Failure to comply with any condition specified pursuant to the provisions of Rule 206 shall be a violation of that rule, this permit, as well as any applicable section of the California Health & Safety Code and applicable federal requirement. Table 9.1 lists the permit conditions by number. Table 9.2 specifies what Section 9 conditions singly apply to the Santa Barbara County Public Works Department ("SBCPW"), NEOT or MMTE permittees, and also those conditions which apply jointly to all permittees of this project.

Table 9.1 - Permit Conditions

<u>NUMBER</u>	<u>TITLE</u>
<i>General</i>	
1	Condition Acceptance
2	Grounds for Revocation
3	Defense of Permit
4	Reimbursement of Costs
5	Access to Records and Facilities
6	Compliance
7	Consistency with Analysis
8	Consistency with Local and State Permits
9	Conditions Remain in Force
10	Equipment Maintenance
11	Conflicts Between Conditions
12	Conflict Between Permits
13	Complaint Response
14	As-Built Drawings
15	Facility Use Limitations
16	Permitted Equipment
17	Mass Emission Limitations
18	Operational Increment Fees
<i>Best Available Control Technology</i>	
19	"Placeholder"
20	Standby Enclosed Ground Flare

40 CFR, Subpart WWW Compliance

- 21 Surface Monitoring, Maintenance and Recordkeeping Plan
- 22 Active Collection System Design Plan and Updates
- 23 Active Collection System Operations and Monitoring
- 24 Active Collection System Exceptions Report

Other Emission Sources

- 25 Produced Gas and Purging of Vessels
- 26 Landfill Gas Condensate Usage and Disposition
- 27 Solvent Usage
- 28 "Placeholder"
- 29 "Placeholder"

Emissions Monitoring

- 30 Enhanced Inspection and Maintenance Program
- 31 Source Testing
- 32 Process Stream Sampling and Analysis
- 33 Process Monitoring Systems
- 34 "Placeholder"

Recordkeeping and Reporting Requirements

- 35 Recordkeeping
- 36 Quarterly/Annual Compliance Verification Reports

Table 9.2 - Condition Applicability

Condition Number(s)	Permit Conditions Applicable to (Y= yes; N = no):		
	SBCPW	NEO Tajiguas	MM Tajiguas Energy
1 through 14	Y	Y	Y
15: a), b), d)	N	Y	Y
15: c), g), h)	N	Y	Y
15: e)	N	Y	N
15: f)	N	Y	Y
16	N	Y	Y
17	N	Y	Y
18	N	N	Y
19	N	N	Y
20	N	N	Y
21 ¹	Y	N	N
22	Y	Y	N
23	Y	Y	N
24	Y X	Y	N
25	N	Y	Y
26	N	Y	N
27	Y	Y	Y
30	N	Not Applicable to Standby Enclosed Ground Flare in ATC 9788 Application	Y
31, 32	N	N	Y
33	N ²	Y	Y
35	Y	Y	Y
36(a):	N	Y	Y
36(b), (i) :	Y	N	N
36(c):	Y	Y	Y
36(d):	N	Y	Y
36(e):	N ²	Y	Y
36(f), (g), (h)	Y	Y	Y
36(j):	N	Y	Y
36(k):	N Y	Y	Y

² Attached is the Process Monitor Calibration and Maintenance Plan dated April 30, 1999 in which all applicable parts are identified by and for each facility. The Foxboro Century 108 used for surface monitoring is maintained and calibrated in accordance with 40 CFR 60.753(d) and 60.755(d), by SBCPW.

¹ NSPS – part WWW: A table will be submitted per the Districts request that describes in detail the sections applicable to each facility (SBCPW, NEOT, and MMTE)

General

1. **Condition Acceptance.** Acceptance of this permit by the project shall be considered as acceptance of all terms, conditions and limits of this permit.
2. **Grounds for Revocation.** Failure to abide by and faithfully comply with this permit shall constitute grounds for revocation pursuant to California Health & Safety Code Section 42307 et seq.
3. **Defense of Permit.** The project agrees, as a condition of the issuance and use of this permit, to defend at its sole expense any action brought against the APCD because of the issuance of this permit. The project shall reimburse the APCD for any and all costs including, but not limited to, court costs and attorney's fees which the APCD may be required by a court to pay as a result of such action. The APCD may, at its sole discretion, participate in the defense of any such action, but such participation shall not relieve the project of its obligation under this condition. The APCD shall bear its own expenses for its participation in the action.
4. **Reimbursement of Costs.** All reasonable expenses, as defined in APCD Rule 210, incurred by the APCD, APCD contractors, and legal counsel for all activities that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by the project as required by Rule 210.
5. **Access to Records and Facilities.** As to any condition that requires for its effective enforcement the inspection of records or facilities by the APCD or its agents, the project shall make such records available or provide access to such facilities upon notice from the APCD. Access shall mean access consistent with California Health and Safety Code Section 41510 and Clean Air Act Section 114A.
6. **Compliance.** Nothing contained within this permit shall be construed to allow the violation of any local, State or Federal rule, regulation, ambient air quality standard or air quality increment.
7. **Consistency with Analysis.** Operation under this permit shall be conducted consistent with all data, specifications and assumptions included with the application and supplements thereof (as documented in the APCD's project files) and the APCD's analyses enclosed herein under which this permit is issued.
8. **Consistency with State and Local Permits.** Nothing in this permit shall relax any air pollution control requirement imposed on the project by the County of Santa Barbara in the project Conditional Use Permit No. 95-CP-046(ZA) and any subsequent modifications.
9. **Conditions Remain in Force.** In the event that any condition contained herein is determined to be invalid, all other conditions shall remain in force.
10. **Equipment Maintenance.** All equipment permitted herein shall be properly maintained and kept in good working condition in accordance with the equipment manufacturer specifications at all times.
11. **Conflicts Between Conditions.** In the event that any condition contained herein is determined to be in conflict with any other condition contained herein, then where principles of law do not provide

to the contrary, the condition most protective of air quality and public health and safety shall prevail to the extent feasible.

12. **Conflict Between Permits.** The requirements or limits that are more restrictive from an air quality stand point shall apply if any conflict arises between the requirements and limits of this permit and any other individual permit(s) issued by the APCD for the project facility.
13. **Complaint Response.** The project shall provide the APCD with the current name and position, address and 24-hour phone number of a contact person who shall be available to respond to complaints from the public concerning nuisance or odors. This contact person shall aid the APCD staff, as requested by the APCD, in the investigation of any complaints received, the project shall take corrective action, to correct the facility activity which is reasonably believed to have caused the complaint.
14. **As-Built Drawings.** The project shall provide the APCD with updated drawings (PFDs, P&IDs) prior to clearance to operate under the Source Compliance Demonstration Period of this permit, and within 45 days of any drawings being subsequently revised.
15. **Facility Use Limitations.** Pursuant to this permit, the project shall be limited to the following processing limits:
 - a) A maximum wet landfill gas capture rate of 2000 SCFM, or 2.88 MMSCFD;
 - b) A maximum of 50 ppmv total sulfur content as H₂S equivalents, in the wet landfill gas;
 - c) Placeholder. Deliberately left blank for future use;
 - d) Placeholder. Deliberately left blank for future use;
 - e) Except for startup and shutdown periods involving the light-off of the Standby Ground Flare pilot, whenever the project is utilizing the Standby Ground Flare to dispose of all collected landfill gas, it shall operate at a temperature of 1600°F ± 40 °F;
 - f) All collected landfill gas shall be delivered to the Standby Ground Flare for combustion and NMOC control purposes, except as authorized for use in an IC engine powered generator as permitted under other APCD permits;
 - g) The landfill gas delivered to the Standby Ground Flare shall range in high heating value between 420 and 520 Btu/SCF; and
 - h) The landfill gas collection and Standby Ground Flare systems shall not be shut down and inoperable for any more than 120 consecutive hours.

The project shall track in a log(s), on a daily basis, the actual production data for the parameters a), e) and f) limited by this condition (using an APCD-approved format). Records shall be retained by the permittees to verify compliance with the other limitations of this condition consistent with the

Recordkeeping requirements of this permit.

16. **Permitted Equipment.** Only those equipment items listed in Attachment 10.1 are covered by the requirements of this permit and APCD Rule 201.D.
17. **Mass Emission Limitations.** Mass emissions for each emissions unit associated with the project shall not exceed the limits listed in Tables 5.2 and 5.3 of this permit. Each emissions unit shall comply with the emission factors specified in Table 5.4. In addition, the project shall not exceed the device capacity specification values for each emission unit as listed in Table 5.1. Compliance with, and enforcement of the device-specific emission limits, and capacities listed in this permit shall be determined through the monitoring, reporting and recordkeeping requirements of this permit.
18. **Operational Increment Fees.** As mitigation for the consumption of project generated NO₂ and PM₁₀ increment beyond the baseline established under Rule 803.I.2, the project shall pay alternative mitigation fees upon initiation of the SCDP under this permit, according to the schedule shown in Table 9.3.

Best Available Control Technology

19. **"Placeholder".** Deliberately left blank for future use.
20. **BACT - Standby Ground Flare.** The project shall apply emission control and plant design measures which represent Best Available Control Technology (BACT), to the operation of the Standby Ground Flare equipment unit as described in Section 4.4 and Table 4.2 of this permit, as well as permit conditions 15, 17, 30 and 31 herein. BACT measures for this equipment shall be in place and operational at all times for the life of the project.

40 CFR, Subpart WWW Compliance

21. **Surface Monitoring, Maintenance and Recordkeeping Plan.** The Santa Barbara County Public Works Department (SBCPW) shall follow the Surface Monitoring, Maintenance and Recordkeeping ("SMMR") Plan dated April 16, 1999 and approved by the APCD on May 13, 1999 to fulfill the requirements of NSPS, 40 CFR, Subpart WWW, §60.753(d) to control landfill surface methane gas emissions. Any corrective actions required to comply with §60.753(d) shall be performed consistent with the requirements of §60.755(c). The SMMR Plan may only be revised upon written request to, and approval from the APCD.
22. **Active Collection System Design Plan and Updates.** The SBCPW shall comply with the Active Collection System Design ("ACSD") Plan dated June 10, 1997. The ACSD Plan documents how the project meets the requirements of 40 CFR, Subpart WWW, §60.759, §60.753 and §60.753(a). The ACSD Plan (and the collection well map) shall be updated every calendar quarter to document the repair/rework, shut down, or installation of existing/new wells required to maintain surface or perimeter methane emissions in compliance with 40 CFR, Subpart WWW, §60.755(b) and §60.755(c)(4)(v) requirements.

23. **Active Collection System – Well Monitoring Program.** The project shall operate and adjust the gas flow rate, temperature, pressure (or vacuum), and nitrogen/oxygen content of each active well consistent with the requirements of 40 CFR, Subpart WWW, §60.753(b), (c), (d) and (g). Well monitoring data shall be collected consistent with the requirements of 40 CFR, Subpart WWW, §60.756 and Condition No. 33 of this permit. This data shall be reported quarterly to the APCD in the format approved by the APCD on July 26, 1999. The Well Monitoring Program data reported, and its format may only be revised upon written request to, and approval from the APCD.
24. **Active Collection System – Exceptions Report.** Annually, the project shall submit to the APCD a report consistent with the provisions of Subpart WWW, §60.757(f), detailing any exceptions to operations standards for active collection systems designed in accordance with 40 CFR, Subpart WWW, §60.752(b)(2)(ii).

Other Emission Sources

25. **Collected Landfill Gas and Purging of Vessels.** The project shall direct all collected landfill gases to the IC Engine/Afterburner unit, or the Standby Ground Flare, or other permitted control device when de-gassing, purging or blowing down any tank, vessel or container that contains landfill gases due to activities that include, but are not limited to, process or equipment turnarounds, process upsets or agency ordered safety tests.
26. **Landfill Gas Condensate Usage and Disposition Plan.** All landfill gas condensate collected by the project shall be handled and disposed of consistent with the Condensate Disposal ("CD") Plan dated April 30, 1999 and approved by the APCD on July 26, 1999. The CD Plan may only be revised upon written request to, and approval from the APCD. Landfill gas condensate collected by the project shall not in whole, or in part, be used as a dust control suppressant at the Tajiguas Landfill without written APCD approval in advance.
27. **Solvent Usage.** The project shall comply with the requirements listed below for all solvent usage, including surface coatings used to maintain equipment:
 - a) The project shall record in a log the following on a monthly basis for each solvent used: amount used; the percentage of ROC by weight (as applied); the solvent density; the amount of solvent reclaimed for APCD-approved disposal; whether the solvent is photochemically reactive; and, the resulting emissions to the atmosphere in units of pounds per month and pounds per day. Product sheets (MSDS or equivalent) detailing the constituents of all solvents shall be maintained in a readily accessible location at the plant.
 - b) The project may submit a Plan to the APCD for the disposal of any reclaimed solvent. If the Plan is approved by the APCD, all solvent disposed of pursuant to the Plan will not be assumed to have evaporated as emissions into the air and, therefore, will not be counted as emissions from the source. The project shall obtain APCD approval of the procedures used for such a disposal Plan. The Plan shall detail all procedures used for collecting, storing and transporting the reclaimed solvent. Further, the ultimate fate of these reclaimed solvents must be stated in the Plan.

- c) Vessels or containers used for storing materials containing organic solvents shall be kept closed unless adding to or removing material from the vessel or container.
- d) All materials that have been soaked with cleanup solvents shall be stored, when not in use, in closed containers that are equipped with tight seals.
- e) Solvent leaks shall be minimized to the maximum extent feasible or the solvent shall be removed to a sealed container and the equipment taken out of service until repaired. A solvent leak is defined as either the flow of three liquid drops per minute or a discernible continuous flow of solvent.

28. **"Placeholder"**. Deliberately left blank for future use.

29. **"Placeholder"**. Deliberately left blank for future use.

Emissions Monitoring

30. **Enhanced Inspection and Maintenance Program**. Deliberately left blank. This condition is not operative under this permit.

31. **Source Testing**. The following source testing provisions shall apply:

- a) The project shall conduct source testing of air emissions and process parameters listed in Section 4.6.1 and Table 4.3 of this permit. More frequent source testing may be required if the equipment does not comply with permitted limitations or if other compliance problems occur, as determined by the APCO. Source testing shall occur within plus or minus thirty days of the anniversary date of the initial source test accomplished during the SCDP, or other time frame if approved, in writing, by the APCD.
- b) The project shall submit a written source test plan to the APCD for approval at least thirty (30) calendar days prior to initiation of each source test. The source test plan shall be prepared consistent with the APCD's Source Test Procedures Manual (revised May 1990 and any subsequent revisions) and Section 4.6.1 of this permit. This plan shall include a technical evaluation on how the equipment will be tested at the maximum safest load, or an alternative load if approved by the APCD, in writing, prior to the test. The project shall obtain written APCD approval of the source test plan prior to commencement of source testing. The APCD shall be notified at least ten (10) calendar days prior to the start of source testing activity to arrange for a mutually agreeable source test date when APCD personnel may observe the test.
- c) Source test results shall be submitted to the APCD within forty-five (45) calendar days following the date of source test completion and shall be consistent with the requirements approved within the source test plan and Section 4.6.1. Source test results shall demonstrate compliance with emission rates in Section 5, Table 4.1 (BACT standards), permit conditions, NSPS and applicable APCD rules. All APCD costs associated with the review and approval of all plans and reports and the witnessing of tests shall be paid by the

project as provided for by APCD Rule 210.

- d) A source test for an item of equipment shall be performed on the scheduled day of testing (the test day mutually agreed to) unless circumstances beyond the control of the operator prevent completion of the test on the scheduled day. Such circumstances include mechanical malfunction of the equipment to be tested, malfunction of the source test equipment, delays in source test contractor arrival and/or set-up, or unsafe conditions on site. Except in cases of an emergency, the operator shall seek and obtain APCD approval before deferring or discontinuing a scheduled test, or performing maintenance on the equipment item on the scheduled test day.

Once the sample probe has been inserted into the exhaust stream of the equipment unit to be tested (or extraction of the sample has begun), the test shall proceed in accordance with the approved source test plan. In no case shall a test run be aborted except in the case of an emergency or unless approval is first obtained from the APCD. If the test can not be completed on the scheduled day, then the test shall be rescheduled for another time with prior authorization by the APCD. Failing to perform or complete the source test of an equipment item on the scheduled test day without a valid reason and without APCD's prior authorization, except in the case of an emergency, shall constitute a violation of this permit. If a test is postponed due to an emergency, written documentation of the emergency event shall be submitted to the APCD by the close of the business day following the scheduled test day.

32. **Process Stream Sampling and Analysis.** The project shall sample and analyze the process streams listed in Section 4.6.2 of this permit consistent with the requirements of that section. All process stream samples shall be taken according to APCD-approved ASTM methods and must follow traceable chain of custody procedures. The project shall maintain logs and records documenting the results from all process stream analyses (in a format approved by the APCD).
33. **Process Monitoring Systems.** All plant process monitoring devices listed in Section 4.6.3 shall be properly operated, maintained, and calibrated according to the *Process Monitor Calibration and Maintenance Plan* dated April 30, 1999 and approved by the APCD on July 26, 1999. The Plan may only be revised upon written request to, and approval from the APCD.
34. **"Placeholder".** Deliberately left blank for future use.

Recordkeeping and Reporting

35. **Recordkeeping.** All records and logs required by this permit and any applicable APCD, state or federal rule or regulation shall be maintained for a minimum of five calendar years at the plant. These records or logs shall be kept at the facility and/or readily accessible and made available to the APCD within four hours of its request.

36. **Quarterly/Annual Compliance Verification Reports.** The project shall submit a report to the APCD within 45 days of the end of each calendar quarter containing information necessary to verify compliance with the emission limits and other requirements of this permit. These reports shall be in the April 30, 1999 format approved by the APCD on July 1, 1999. Compliance with all required limitations shall be documented in the submittals. All logs and other basic source data not included in the report shall be available to the APCD upon request. The fourth quarter report for each year shall also include an annual report for the prior four quarters. Pursuant to Rule 212, the annual report shall include a completed APCD Annual Emissions Inventory questionnaire. Except where noted, the report shall include monthly summaries of the following information:

- a) Production Report (on a daily basis): i) the total SCF per day of landfill gas burned by the Standby Ground Flare system; ii) the maximum SCFM flow rate of landfill gas burned by the Standby Ground Flare each day; iii) the operating hours per day of the Standby Ground Flare and gas collection system.
- Just daily* - (b) Landfill surface emissions monitoring data consistent with the SMMR Plan and Condition No. 21.
- c) General solvent usage report. - Annual *Permits Approved Schedule cleared*
- d) Process stream analyses report (according to permit Section 4.6.2 requirements).
- e) Process monitors calibration report pursuant to Condition No. 33.
- f) Breakdowns and variances reported/obtained per Regulation V along with the excess emissions that accompanied each occurrence. - Annual
- g) On an annual basis, the ROC and NO_x emissions from all permit exempt activities such as maintenance activities involving IC engine driven equipment, or surface coating activities.
- h) Tons per quarter totals of all project pollutants (by each emission unit) along with the appropriate supporting data. The fourth quarter report shall include tons per year totals for all pollutants (by each emission unit).
- ILB3 Routine ETR Report is 2/15/99* - (i) Active Collection System Design Plan and Updates pursuant to the requirements of Condition No. 22.
- (j) Active Collection System - Well Monitoring Program data pursuant to requirements of Condition No. 23.
- k) Active Collection System - Exceptions Report pursuant to requirements of Condition No. 24.

AIR POLLUTION CONTROL OFFICER

Douglas W. Allard

March 31, 2000 _____

Date

Notes:

- 1) This ATC/PTO supersedes the requirements of ATC 9788 applicable to the Standby Ground Flare and landfill gas collection systems.
- 2) Reevaluation date for this ATC/PTO is March 2003.

Table 9.3 - Operational Increment Fees

Year After SCDP Start	Required Increment Fee Payment	Due Date
0	\$9,790	December 1998
1	\$8,811	December 1999
2	\$7,832	December 2000
3	\$6,853	December 2001
4	\$5,874	December 2002
5	\$4,895	December 2003
6	\$3,916	December 2004
7	\$2,937	December 2005
8	\$1,958	December 2006
9	\$979	December 2007

10. ATTACHMENTS

	<u>No. of Pages</u>
10.1 Permitted Equipment Listing	3
10.2 Emission Factor Conversion Formulae	2
10.3 BACT Analysis - Landfill Gas Fired Enclosed Ground Flares	1
10.4 Health Risk Assessment Air Toxics Input Data	1
10.5 Enclosed Ground Flare Source Test Results Summary (2/25/99)	1

10.1 Equipment Listings

Combustion Units

General Information

1	Quantity	1
2	Device Type	Flare/Afterburner
3	Device Name	Flare/Afterburner Skid
4	Year Installed	circa 1998'
5	Manufacturer	No
6	Device Description	

Device Specific Information

1	Manufacturer	LFG Specialties
2	Model Number	ERA 840 I 8
3	Device Type	TBD
4	Capacity (MMBtu/hr)	96
5	Design Capacity (MMBtu/hr)	40
6	Device Type	Semi-dry Landfill Gas
7	Device Type	Enclosed Ground Flare
8	Design Capacity (MMBtu/hr)	Afterburner @ 10.75
9	Design Capacity (MMBtu/hr)	As LFG Flare @ 54.68
10	Device Type	Semi-dry Landfill Gas
11	Design Capacity (MMBtu/hr)	No
12	Design Capacity (MMBtu/hr)	420 to 520
13	Design Capacity (MMBtu/hr)	Btu/SCF
14	Design Capacity (MMBtu/hr)	50
15	Equipped with Pilot?	Yes
16	Pilot Fuel	Propane
17	Is Pilot Continuous?	No (just startup)
18	Equipped with Temperature Control?	Yes
19	Temp Control Method	Combustion Air
20	Equipment Owner/Operator	MMTC

10.1 Equipment Listings (continued)

Pumps and Compressor Units

General Information

1 Device ID Number	1
2 Device Description	Flare Blower
3 Device Size	Flare/Afterburner
4 Skid	Skid
5 Start Date	circa 1998'
6 Permit exemption - Rule 202?	No
6 Specific Rule 202 exemption	

Device Specific Information

1 Manufacturer	TBD
2 Model Number	TBD
3 Serial Number	TBD
4 Service	Wet Landfill Gas
5 Fuel Source	Wet Landfill Gas
6 Rated Capacity (GPM)	2000
7 Drive Type	Electric
8 Operating Pressure (PSI)	40 to 50
9 Unit Weight (lbs)	n/a
10 Seal Source - n/a (no phosgene?)	n/a
11 Seal Vent - n/a (no phosgene?)	n/a
12 Equipment Owner/Operator	NEOT

10.1 Equipment Listings (continued)

Pressure Vessels

General Information

	1	2	3
1 Description	Condensate Knockout Box	Inlet Gas Scrubber	Collection Wells
2 Location	Flare/Afterburner Skid	Gas Skid	Landfill Area
3 Date Installed	circa 1998'	circa 1998'	circa 1998'
4 Size (inches)	No	No	No
5 Pressure (PSI)	No	No	No
6 Specification			

Device Specific Information

1 Manufacturer	TBD	TBD	TBD
2 Model Number	TBD	TBD	TBD
3 Serial Number	TBD	TBD	TBD
4 Service	Wet Landfill Gas	Comprsd. Landfill Gas	Wet Landfill Gas
5 Material	TBD	TBD	TBD
6 Emission (lb/hr)	TBD	TBD	TBD
7 Temperature	TBD	TBD	TBD
8 Operating Pressure (PSI)	< 0	> 0	< 0
9 Operating Temperature (°F)	TBD	TBD	per 40 CFR, WWW
10 Connections (inches)	n/a	n/a	yes
11 PDEs to Inlet/Outlet	n/a	n/a	n/a
12 PDEs to Atmosphere	TBD	TBD	TBD
13 Equipment Owner/Operator	NEOT	MMTC	NEOT

10.2 Emission Factor Conversion Formulae

A. lb/MMBtu to ppmvd: (applies to any combustion equipment unit)

{@ 3% exhaust oxygen (dry basis) & standard conditions (1.0 atm., 60 °F)}

$$\text{ppmvd}_i = \text{SCF}_i / \text{MMSCF}_{\text{exhaust}} =$$

$$\text{lb}_i / \text{MMBtu} * (\{\text{Fuel "F" factor @ 0\% O}_2\}^{-1}, \text{MMBtu/SCF}_{\text{exhaust}}) *$$

$$(\text{MW}_i^{-1}, \text{lb-mole/lb}_i) * (379 \text{ SCF}_i / \text{lb-mole}) * (10^6 / \text{MM}) * (\text{XSA}, [20.9-3.0] / [20.9-0.0])$$

--OR--

$$\text{ppmvd}_i = \text{lb}_i / \text{MMBtu} * K_{F|b}$$

where, $K_{F|b}$ is the following:

$$K_{F|b} = (\{\text{Fuel "F" factor @ 0\% O}_2\}^{-1}, \text{MMBtu/SCF}_{\text{exhaust}}) *$$

$$(\text{MW}_i^{-1}, \text{lb-mole/lb}_i) * (379 \text{ SCF}_i / \text{lb-mole}) * (10^6 / \text{MM}) * (\text{XSA}, [20.9-3.0] / [20.9-0.0])$$

B. g/bhp-hr to ppmvd: (these formulae apply only to IC engine equipment units)

{@ 3% exhaust oxygen (dry basis) & standard conditions (1.0 atm, 60 °F)}

$$\text{ppmvd}_i = \text{SCF}_i / \text{MMSCF}_{\text{exhaust}} =$$

$$\text{g/bhp-hr} * (\text{BSFC}^{-1}, \text{bhp-hr/Btu}) * (\text{lb}_i / 454\text{g}) * (\{\text{Fuel "F" factor @ 0\% O}_2\}^{-1}, \text{MMBtu/SCF}_{\text{exhaust}}) *$$

$$(10^6 \text{ Btu/MMBtu}) * (\text{MW}_i^{-1}, \text{lb-mole/lb}_i) * (379 \text{ SCF}_i / \text{lb-mole}) *$$

$$(10^6 / \text{MM}) * (\text{XSA}, [20.9-3.0] / [20.9-0.0])$$

-- OR --

$$\text{ppmvd}_i = \text{g/bhp-hr} * (\text{BSFC}^{-1}, \text{bhp-hr/Btu}) * K_{Fg}$$

where K_{Fg} is the following:

$$K_{Fg} = (\text{lb}_i / 454\text{g}) * (\{\text{Fuel "F" factor @ 0\% O}_2\}^{-1}, \text{MMBtu/SCF}_{\text{exhaust}}) * (10^6 \text{ Btu/MMBtu}) *$$

$$(\text{MW}_i^{-1}, \text{lb-mole/lb}_i) * (379 \text{ SCF}_i / \text{lb-mole}) * (10^6 / \text{MM}) * (\text{XSA}, [20.9-3.0] / [20.9-0.0])$$

C. Acronym Description and Reference used in Items A & B above:

- F = 40 CFR, §60.45.(4) fuel expansion factor @ 0% excess exhaust oxygen, dry basis; corrected to 60 °F from 68 °F.
- MW = Average molecular weight of exhaust pollutant specie(s), lb/lb-mole
- BSFC = ICE's brake specific fuel consumption, fuel HHV basis.
- XSA = Excess air correction factor from 0% to 3% exhaust oxygen {dimensionless constant @ 0.856}.

10.2 Emission Factor Conversion Formulae (continued)**Emissions Calculations
Supplemental Information****Landfill Gas Fired Equipment (Engines & Afterburner/Flares)****I. Default Data Used in Exhaust Pollutant Conversion Calculations****A. Average Exhaust Pollutant Molecular Weights:**

	<u>lb_i/lb-mole</u>	<u>Reference</u>
1. NO _x as NO ₂ :		46.01 Periodic Table Data
2. CO	28.01	Periodic Table Date
3. ROC (no methane & ethane - as hexane equivalents)	86	AP-42, Section 2.4 basis for landfill gas fired equipment

B. Default Natural Gas Fuel 40 CFR "F" Factor: 8608 SCF/MMBtu @ 0% excess oxygen**C. Landfill Gas "F" Factor (accounting for 50% of LFG that is CO₂ and thus inert):**

LFG "F" = 40 CFR "F" + 50% of LFG volume that equates to 1.0 MMBtu

50% of LFG volume that equates to 1.0 MMBtu =

$$1.0 \text{ MMBtu} \div (455 \text{ Btu/SCF}) * (50\%/100\%) * (10^6/\text{MM}) = 1099 \text{ SCF}$$

Therefore: LFG "F" = 8608 + 1099 = 9707 SCF/MMBtu

D. Calculated K_{LFGlb} & K_{LFGg} : (for landfill gas fired equipment) at 3% excess oxygen

	<u>NO_x</u>	<u>ROC</u>	<u>CO</u>
K_{LFGlb}	726.4	388.6	1,193.2
K_{LFGg}	1,600,000	856,000	2,630,000

10.3 BACT Analysis - Landfill Gas - Fired Enclosed Ground Flare

Equipment/Pollutant	Applicant Proposed	BAAQMD	SCAQMD	SJVUAPCD
Landfill Gas Flare (non-hazardous Landfill) Rating ⇒ ???	<i>Standby Ground Flare afterburner, rated to 50 MMBtu/hr gas flows</i>	80.1 (10/18/91) Rating ⇒ All	80 (10/7/88) Rating ⇒ All	1-13 (10/1/95) Rating ⇒ > 24 MMBtu/hr
NO _x	0.060 lb/MMBtu	T/F: <0.06 lb/MMBtu (n/s) AIP: 0.06 lb/MMBtu (n/s)	T/F: see BAAQMD AIP: see BAAQMD	T/F: 0.05 lb/MMBtu AIP: 0.06 lb/MMBtu
ROC	0.048 lb/MMBtu. 1600 °F combustion temperature and 1.05 second residence time	T/F: n/d (n/d) AIP: >0.6 sect R/Time & >1399 °F temp (Grnd lvl, enclosed design)	T/F: n/d (n/d) AIP: >0.6 sect R/Time & >1399 °F temp & auto shutoff controls (grnd lvl, enclosed design)	T/F: n/d (n/s) AIP: n/d (n/s)
PM ₁₀	Not Triggered under Rule 802 or Rule 803			

n/d: no determinations

n/s: no selections made

10.4 Health Risk Assessment Air Toxics Input Data

Tajiguas Landfill Gas to Energy Project - Ground Flare Plume Toxics														
Raw Landfill Gas Toxics Content and Post-combustion Emissions														
Afterburner/Flare Plume Toxics Content Using AP-42, February 25, 1999 Source Test Data and Other Assumptions														
						M M Btu/hr								
Landfill Gas Flow Rate (design)		2000	SCFM	5.277	lb-moles/min	62.64								
IC Engine Fuel Flow		0	SCFM	0.00	% by vol.	0.00								
Flare Fuel Flow		2000	SCFM	100.00	% by vol.	62.64								
Shaded Cells means the AP-42, Section 2.4 Landfills, NMOC default destruction efficiency assumed for that species.														
This spreadsheet assumes all NMOC DREs are flare based, since all exhaust exits through a flare/afterburner.														
Landfill gas speciation from July 1996 Test Flare Derived Data at Tajiguas Landfill.														
Note: "ND" means not detected.														
25-Feb-99														
Observed Actual														
Mass Emissions														
lb/hr lb/yr														
Species														
CAS#														
A HAP														
per EPA?														
In the LF Gas														
(ppbv)														
Raw Toxics														
(lb moles/min)														
Combustion Destruction Efficiency														
Per AP-42, Sec. 2.4														
Assumed														
By an ICE														
By a Flare														
% Dest														
Flare Plume														
Toxics														
(lb moles/min)														
Species														
MW														
(lb/lb-mole)														
ATC 9788 Estimated														
Mass Flow in Afterburner/Flare Plume														
(g/sec)														
lb/yr														
lb/hr														
lb/hr														
lb/yr														
Vinyl Chloride														
75-01-4														
yes														
590														
3.11E-06														
97.61														
97.61														
7.44E-08														
62.43														
3.52E-05														
2.44														
0.000279														
ND														
Chloroethane														
75-00-3														
yes														
1400														
7.39E-06														
97.6														
97.6														
1.24E-06														
64.43														
6.07E-04														
42.13														
0.00481														
ND														
Acetone														
67-64-1														
no														
9500														
5.01E-05														
8.44E-06														
58														
3.71E-03														
257.36														
0.029379														
ND														
Trichlorofluoromethane														
75-69-4														
no														
220														
1.16E-06														
1.96E-07														
137.3														
2.03E-04														
14.11														
0.001611														
ND														
Methylene chloride														
75-09-2														
yes														
1500														
7.92E-06														
1.90E-07														
84.86														
1.22E-04														
8.47														
0.000967														
0.0014138														
12.38														
Trichlorotrifluoroethane														
76-13-1														
?														
180														
9.50E-07														
1.60E-07														
187.3														
2.27E-04														
15.75														
0.001798														
ND														
cis-1,2-dichloroethane														
156-59-2														
yes														
1600														
8.44E-06														
1.42E-06														
98.86														
1.06E-03														
73.88														
0.008434														
ND														
1,1-dichloroethane														
75-34-3														
yes														
1400														
7.39E-06														
1.24E-06														
98.86														
9.31E-04														
64.65														
0.00738														
ND														
2-Butanone														
78-93-3														
?														
10000														
5.28E-05														
8.89E-06														
148.21														
9.97E-03														
692.25														
0.079024														
ND														
1,1,1-trichloroethane														
71-55-6														
yes														
270														
1.42E-06														
92.47														
85.24														
85.24														
2.10E-07														
131.29														
2.09E-04														
14.51														
0.001657														
ND														
Benzene														
71-43-2														
yes														
770														
4.06E-06														
83.83														
89.5														
89.5														
4.27E-07														
78														
2.52E-04														
17.49														
0.001997														
0.00030376														
2.66														
Trichloroethene														
79-01-6														
yes														
690														
3.64E-06														
89.6														
96.2														
96.2														
1.38E-07														
131.35														
1.38E-04														
9.55														
0.00109														
0.000047018														
0.41														
4-methyl-2-pentanone														
108-10-1														
?														
1000														
5.28E-06														
8.89E-07														
100														
6.72E-04														
46.71														
0.005332														
ND														
Toluene														
108-88-3														
?														
16000														
8.44E-05														
79.71														
93.55														
93.55														
5.45E-06														
92														
3.79E-03														
263.34														
0.030061														
0.00047018														
4.12														
Tetrachloroethene														
127-18-4														
yes														
1200														
6.33E-06														
89.41														
85.02														
85.02														
9.49E-07														
165.72														
1.19E-03														
82.63														
0.009432														
ND														
Ethylbenzene														
100-41-4														
yes														
7200														
3.80E-05														
6.40E-06														
108														
5.23E-03														
363.20														
0.041461														
0.000029589														
0.26														
Styrene														
100-42-5														
?														
390														
2.06E-06														
3.47E-07														
104														
2.73E-04														
18.94														
0.002163														
ND														
m-p-xylenes														
1330-20-7														
yes														
16000														
8.44E-05														
1.42E-05														
106														
1.14E-02														
792.16														
0.090429														
0.00029244														
2.56														
o-xylene														
95-47-6														
yes														
5400														
2.85E-05														
4.80E-06														
106														
3.85E-03														
267.35														
0.03052														
0.000077512														
0.68														
Chloromethane														
Not Estimated														
0.00044937														
3.94														
Assume that Combustion Byproducts are based on flare emission factors except for PAHs (no naphthalene) that are assumed to be IC Engine based em. facs.														
Emission Factors														
ICE														
ICE > 1000 bhp														
Flare (10-100 M M Btu/hr)														
lb/M M Btu														
lb/M M Btu														
(g/sec)														
lb/yr														
lb/hr														
formaldehyde														
0.03713867														
1.17143E-05														
9.25E-05														
6.43														
0.000734														
PAHs (incl. naphthalene)														
0.00018705														
3.80952E-07														
2.26E-06														
0.16														
1.79E-05														
naphthalene														
0.00017														
2.85714E-07														
1.35E-04														
9.35														
0.001068														
PAHs (no naphthalene)														
1.7048E-05														
9.52381E-08														
2.33E-05														
1.62														
0.000185														
acetaldehyde														
0.00107886														
2.95238E-06														
2.03E-05														
1.41														
0.000161														
acrolein														
0.00043238														
2.57143E-06														
3.99E-03														
276.98														
0.031618														
Actual Toxic Emissions														
Combustion & Residual														
(lb/yr)														
(tons/yr)														
(lb/yr)														
(tons/yr)														
Totals (Combustion byproducts and non-destroyed)														
4.81E-02														
3342.87														
1.67														
322.96														
0.16														
Conclusion: Observed toxics are an order or magnitude less than estimated under ATC 9788.														

10.5 Enclosed Ground Flare Source Test Results Summary (2/25/99)

AEROS ENVIRONMENTAL, INC.

Summary Of Results

Tajiguas Landfill Gas to Energy Project
Tajiguas Landfill
Gas Enclosed Flare

Project 209-1466
February 25, 1999
Permit: 9788

Pollutant	ppm	ppm @ 3% O ₂	lb/hr	lb/day	lb/MMBtu	Permit Limits
NOx	16.6	31.3	2.13	51.06	0.0410	44 ppm @ 3% O ₂ 2.62 lb/hr 62.9 lb/day
	16.3	31.4	2.07	49.75	0.0411	
	16.1	31.6	2.07	49.73	0.0414	
	Mean	16.3	31.4	2.09	50.18	0.0411
CO	3.0	5.6	0.23	5.56	0.0045	12.67 lb/hr 304.0 lb/day
	0.9	1.8	0.07	1.74	0.0014	
	0.6	1.2	0.05	1.16	0.0010	
	Mean	1.5	2.9	0.12	29.88	0.0023
Inlet ROC	354.0		7.79			
C ₃ -C ₆ + as Hexane	360.0		7.69			
	374.2		7.94			
Mean	362.7		7.81			
Outlet ROC						
C ₃ -C ₆ + as Hexane						
Mean	< 0.27		< 0.025			
Destruction Efficiency, ROC inlet compared to ROC Outlet					> 99.68 %	98 %
Outlet NMOC as Hexane	< 0.2	< 0.3	< 0.04	< 0.96	< 0.00077	20 ppm @ 3% O ₂ 2.10 lb/hr 50.3 lb/day
	0.2	0.3	0.04	0.96	< 0.00078	
	0.2	0.4	0.05	1.20	< 0.00099	
	Mean	0.2	0.3	1.04	< 0.00085	0.048 lb/MMBtu
Total Sulfur as H ₂ S	25 ppm					
Comments:						
Flare Residence Time: 1.91 Sec.						
Average Stack Temp. 1598 ° F						
Landfill Gas Flow rate 1583 SCFM						
Condensate PSI 30.0						
The Outlet ROC's were less than the Detection Limit, therefore 1/2 the DL was reported						